

Best Practice Recommendations 2

FOR CANADIAN HARM REDUCTION PROGRAMS THAT PROVIDE SERVICE TO PEOPLE WHO USE DRUGS AND ARE AT RISK FOR HIV, HCV, AND OTHER HARMS

WORKING GROUP ON BEST PRACTICE FOR HARM REDUCTION PROGRAMS IN CANADA



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Disclaimer

The opinions and recommendations in this document reflect those of the authors and do not necessarily reflect those of their employers or the Canadian Institutes of Health Research.



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Overview of the Best Practice Recommendations: Part 2

The Best Practice Recommendations for Canadian Harm Reduction Programs that Provide Service to People Who Use Drugs and are at Risk for HIV, HCV, and Other Harms: Part 2 is the second set of recommendations created by the Working Group on Best Practice for Harm Reduction Programs in Canada. These recommendations were developed to help needle and syringe programs (NSPs) and other harm reduction programs across the country improve service delivery to people who use drugs. The table below outlines the contents of Parts 1 (Strike et al., 2013) and 2 of the Best Practice Recommendations.

Part 1	Part 2
Needle and syringe distribution	Program delivery models (includes fixed-site NSPs, mobile NSPs, pharmacy-based distribution and purchase, peer-based outreach, and needle/syringe vending machines)
Cooker distribution	Needle distribution for anabolic steroid injection, hormone injection, piercing and/or tattooing
Filter distribution	Foil distribution
Ascorbic acid distribution	Safer crystal methamphetamine smoking equipment distribution
Sterile water distribution	Injection-related complications –prevention, assessment and treatment
Alcohol swab distribution	Testing services for HIV, hepatitis C, hepatitis B, and tuberculosis
Tourniquet distribution	Vaccination services for hepatitis A and B, pneumococcal pneumonia, influenza, tetanus, and diphtheria
Safer crack cocaine smoking equipment distribution	HIV and/or hepatitis C treatment referrals
Safer drug use education	Substance use treatment referrals
Handling and disposal of used drug use equipment	Mental health services referrals
Overdose prevention: education and naloxone distribution	Housing services referrals
	Relationships with law enforcement
	Education and other services for the prison context

Both sets of recommendations aim to assist programs and communities to:

- Improve effectiveness, quality, and consistency of harm reduction program services
- Reduce transmission of HIV, HCV, HBV, and other harms
- Make informed decisions about the use of resources for effective and efficient practice
- Advocate for better resources and investment in harm reduction programs
- Provide benchmarks to evaluate harm reduction program services
- Identify targets for improvement at the individual program and systems levels

Together, Parts 1 and 2 are intended to expand upon and replace recommendations previously disseminated by British Columbia (BCCDC, 2008; Buxton et al., 2008) and Ontario (Strike et al., 2006). Evaluations of these earlier documents demonstrate impressive implementation of the recommendations (Buxton et al., 2008; Strike et al., 2011). We hope to achieve even more widespread uptake of the new recommendations.

Recommended policies versus program activities in Part 2

In Part 2, we draw on evidence primarily about NSPs since these are among the most researched harm reduction programs. A considerable amount of published evidence was available for some chapters (e.g., program delivery models, injection-related complications, testing services, vaccination services), while evidence was more limited for other chapters (e.g., foil distribution, safer crystal methamphetamine smoking equipment distribution). In chapters where we found abundant supporting evidence, we recommend specific best practice policies. In chapters with limited supporting evidence, we recommend activities to evaluate the need for the service. For example, in the chapter about the distribution of foil sheets for smoking heroin and other drugs, we recommend, among other activities, that programs assess the prevalence of heroin smoking and related smoking harms and the level of support for foil distribution among people who use drugs.

Our team – Working Group on Best Practice for Harm Reduction Programs in Canada

Based on the principles of community-based research, our project arose from a community-identified need. From inception to dissemination, this project has involved community members and service providers; the full team has included people with lived experience, service providers, policy makers, and researchers. Team members joined the project based on their interest, expertise (e.g., service provision, policy), and their roles as representatives within their communities, stakeholder groups, and/or regions. We used a consensus-based process whereby all team members contributed to the design and implementation of the project.

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Sexual Health Promotion for People Who Use Drugs – A comment

In this document, our primary focus is on evidence about how to prevent drug-related harms. As we developed this document, we decided not to focus on evidence about sexual risks and prevention because there are existing Canadian Guidelines on Sexually Transmitted Infections that were developed by another expert working group. These guidelines can be retrieved from the Public Health Agency of Canada's (PHAC) website at www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-lcdcits/index-eng.php.

We recognize that drug-related risks and sexual risks often co-occur and that many Canadian harm reduction programs also provide a variety of health and social services including safer sex education, distribution of safer sex supplies (e.g., condoms), and other sexual health-related services (e.g., testing, referrals). As unprotected sex is a risk factor for HIV and numerous other infections, provision of safer sex education, supplies, and related services are important topics relevant to the needs and behaviours of many people who use drugs (e.g., Copenhaver et al., 2006; Des Jarlais & Semaan, 2005; PHAC, 2014; van Empelen et al., 2003). Indeed, the World Health Organization (2009) recognizes safer sex and sexual risk counselling as a priority intervention for HIV prevention. Further, UNAIDS (2009) recommends that safer sex interventions, as well as screening and treatment for sexually-transmitted infections (STIs), be offered alongside harm reduction services for people who inject drugs. In addition to providing sexual health promotion for all clients, harm reduction programs may wish to draw on existing resources to develop targeted programs that address the specific sexual needs of youth, LGBTQ populations such as transgender people and men who have sex with men, and sex workers.

We encourage programs to access several excellent resources that are available:

- For the national STI guidelines, please see the PHAC website at www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-lcdcits/index-eng.php
- For listings of provincial and territorial STI guidelines, please see the PHAC website at www.phac-aspc.gc.ca/std-mts/sti-its/pt-sti-its-eng.php
- For a collection of resources on sexual health and safer sex, including additional guidelines and recommendations, please see the CATIE website at www.catie.ca/en/prevention/sexual-health

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Program delivery models



RECOMMENDED BEST PRACTICE POLICIES to facilitate the delivery of needle and syringe program (NSP) services in a manner that maximizes accessibility for people who use drugs and are at risk of human immunodeficiency virus (HIV), hepatitis C (HCV), hepatitis B (HBV), and other drug-related harms:

Optimize service delivery

- Provide NSP services using a variety of program delivery models (i.e., fixed sites, mobile sites, pharmacy-based distribution, peer-based outreach, and vending machines) that are convenient for clients in terms of geographic location (e.g., urban, rural areas) and time of day, and tailored to reach subpopulations (e.g., youth, women, sex workers, LGBTQ, Indigenous groups, and those who are new to injecting)
- Distribute the full range of injection, smoking, and other harm reduction equipment and provide disposal options at all NSP locations
- Offer a wide range of services (e.g., education, referrals, overdose prevention and intervention, testing, and vaccination) at each venue wherever possible

Expand access

- Develop partnerships with local agencies serving people who use drugs to provide additional venues for clients to receive NSP and other health and social services
- Collaborate with local pharmacies and other organizations to provide no-cost NSP services in rural, underserved, and/or high-needs areas
- Advocate with pharmacists, pharmacies, and professional colleges to ensure clients can purchase and/or obtain needles/syringes for free

Educate, train and evaluate

- Provide clients with information about distribution and disposal venues
- Provide ongoing training and support to peer workers, pharmacists, pharmacy assistants, and others who provide NSP services
- Conduct community education to help increase support for and maintain uninterrupted operation of programs
- Conduct ongoing need and feasibility studies for program models that are not offered and publish findings

Overview of the chapter

In this chapter, evidence about the effectiveness of NSPs in general is reviewed and followed by a review of evidence for specific program delivery models: fixed-site NSPs, mobile NSPs, pharmacy-based distribution, peer-based outreach, and vending machines. These program delivery models are complementary, not mutually exclusive, and each model has its own set of advantages and disadvantages. Although the volume of literature on delivery models is quite uneven, a review of the evidence suggests that a wide spectrum of delivery models can contribute to improving access and minimizing drug-related harms.

Following the first subsection on general NSP effectiveness and the second which summarizes advantages, disadvantages, and considerations for each program model, subsequent subsections each examine a specific delivery model. Each subsection then examines the client characteristics associated with that delivery model, advantages and disadvantages of the model, evidence for its effectiveness, and model-specific issues and considerations.

Section I: General NSP effectiveness in reducing HIV and HCV transmission

Studies have examined the impacts of NSPs on HIV and HCV transmission rates. Earlier reviews of evidence have concluded that NSPs help reduce HIV transmission rates among people who inject drugs (Gibson et al., 2001; Wodak & Cooney, 2004). A recent review of reviews (Aspinall et al., 2014) shows that studies published after 1990 demonstrate a protective impact of NSPs on HIV transmission rates. Although studies examining the effectiveness of NSPs in reducing HIV transmission are subject to limitations (e.g., short follow-up periods) and study design challenges (e.g., higher HIV prevalence among people who inject drugs, accessibility and uptake of services, route of transmission), Aspinall et al. (2014) concluded that there is enough evidence to support the effectiveness of NSPs in reducing HIV transmission among people who use drugs. Aspinall et al. (2014) also note that other harm reduction interventions have likely contributed to reduced transmission rates and NSPs should be viewed as one component of a wider spectrum of harm reduction interventions that aim to reduce HIV.

Other blood-borne infections (HCV and HBV) also disproportionately affect people who inject drugs (Nelson et al., 2011). Evidence suggests that NSPs have less of an impact on HCV transmission and should be viewed as a complementary intervention within a wider harm reduction strategy focussed on HCV prevention (Aspinall et al., 2014). A review of reviews conducted by MacArthur et al. (2014) regarding the effectiveness of different harm reduction interventions in reducing injecting risk behaviours and HIV and HCV transmission concluded that both NSPs and opioid substitution treatment (OST) have a strong impact on decreasing injecting risk behaviours. They found strong evidence to support the effectiveness of OST, and tentative evidence for NSPs, in reducing HIV transmission rates. However, there was little review-level evidence on the effect of OST and NSPs on HCV transmission. MacArthur et al. (2014) also noted that single harm reduction interventions, if not coupled with other types of harm reduction interventions, are insufficient to reduce HCV transmission.

Incorporating other types of harm reduction services to complement NSPs has been highlighted as an approach that might be able to reduce the incidence of HCV. A systematic review of 16 studies has shown that the majority of NSPs – whether community-, hospital- or pharmacy-based – typically combine harm reduction services (i.e., outreach, distribution of harm reduction materials, counselling, and testing services; Jones et al., 2010).

Impact of NSP delivery model on HIV and HCV transmission

A study by Palmateer et al. (2010) concurs with recent reviews that there is tentative evidence showing the effectiveness of NSPs at reducing HIV transmission. This study compared the effectiveness of fixed-site NSPs and alternative models of needle distribution (i.e., pharmacy-based NSPs, vending machines, and peer outreach) on injecting risk behaviours (i.e., borrowing, lending or reuse of needles/syringes or other drug use equipment) and on HIV and HCV transmission. The authors concluded that any single intervention – when used on its own and not combined with other types of harm reduction interventions – is insufficient to reduce HCV transmission. The same study (Palmateer et al., 2010) pointed out that fixed-site NSPs were effective in reducing self-reported injecting risk behaviours, but evidence was tentative regarding reduced HIV transmission. The effectiveness of pharmacy-based NSPs in reducing self-reported injecting risk behaviours was supported by tentative evidence. Palmateer et al. (2010) also demonstrated that the evidence to support the effectiveness of vending machines in reducing injecting risk behaviours and HIV and HCV transmission was either lacking or insufficient. It is worth noting that ecological studies have more often shown a positive effect of NSPs in reducing HIV and HCV transmission, compared to individual-level studies; thus there appears to be a discrepancy between findings from ecological studies and individual-level studies (i.e., case-control and cohort studies; Palmateer et al., 2010). A study by Jones et al. (2010) concluded that there is insufficient evidence to determine if particular models of service delivery are better than others in reducing injecting risk behaviours and/or incidence of HIV or HCV.

Impact of combining NSPs and other harm reduction interventions on transmission

Findings from a recent meta-analysis by Turner et al. (2011) demonstrated a synergistic effect of multiple harm reduction interventions on reducing blood-borne virus transmission. This study showed that the combination of NSPs and OST reduced the risk of HCV seroconversion by 79% compared to those who were not on OST and received less than one needle per injection. Several studies have demonstrated a reduced incidence of HIV and HCV when OST and NSP are combined compared to when these interventions are used alone (Degenhardt et al., 2010; Hagan et al., 2011; Turner et al., 2011; Van Den Berg et al., 2007). A systematic review and meta-analysis by Hagan et al. (2011) of interventions to prevent HCV has shown that HCV infection among people who

inject drugs could be prevented through the use of different harm reduction interventions, whereby the strongest association is found when interventions are combined. Therefore, multi-component interventions that use several strategies (reduction of drug injection rates, adoption of safer injection practices, provision of sterile injecting equipment, behavioural interventions, and substance use treatment) may have a greater impact on HCV prevention among people who inject drugs than the use of single strategies (Hagan et al., 2011). Findings regarding the increased effectiveness of multi-component approaches are also consistent with the conclusions of qualitative studies on HCV in people who inject drugs (Jones et al., 2010; Palmateer et al., 2010; Wright & Tompkins, 2006). An earlier meta-analysis by Hagan et al. (2008) has shown that the period between injecting initiation and the acquisition of HCV is lengthened in high-income countries when NSP and OST services are expanded.

Summary of review-level evidence

Evidence from scientific reviews shows that NSPs are associated with reduced injecting risk behaviours and HIV transmission, but evidence that supports the association between NSPs (particularly when viewed as standalone programs) and reduced HCV transmission remains tentative. There is little available evidence that demonstrates which models of program service delivery are better than others in reducing risk behaviours and HIV or HCV transmission. Nevertheless, there is strong evidence to show the impact of combining NSPs, OST, and other harm reduction programs on HIV risk behaviours. In the sections to follow, we review evidence specific to particular program models.

Section II: Summary of advantages, disadvantages, and considerations by program model

Fixed-site NSPs	
Advantages	<ul style="list-style-type: none"> • Provides the most comprehensive set of harm reduction services • Facilitates the distribution and disposal of injecting equipment • Allows access to several clients at once • Allows in-depth interaction with staff • Ensures higher degree of confidentiality for clients
Disadvantages	<ul style="list-style-type: none"> • Limited hours of operation • Static location • Client fears related to public exposure, confidentiality, and stigmatization • Client fears of exposure to police if seen entering an NSP • Provides limited access for clients with mobility issues (e.g., physical disability, transportation issues)
Considerations	<ul style="list-style-type: none"> • Improve access: select geographic locations based on size of the local drug-using population and estimated number of potential clients, availability of public transportation and other local conditions • Types of setting options: public health, community health centres, AIDS service organizations, hospitals, addiction services and other organizations that serve clients who use drugs • Maximize impact: consider offering a full range of services and supports (i.e., advice on safer injecting practices, safer crack cocaine smoking equipment distribution and advice on safer smoking practices, overdose prevention and intervention, information on safer disposal of used drug use equipment, testing, vaccination, condom distribution, and facilitating access to substance use treatment and other services) • Staffing: consider hiring multidisciplinary staff to maximize the range of services that can be offered (e.g., counselling, education, medical and nursing care, peer support) • Uninterrupted service delivery: involve and educate the community

Mobile NSPs	
Advantages	<ul style="list-style-type: none"> • May reach higher risk clients who do not use fixed sites • Increases access within local drug scenes for people who cannot or do not access fixed-site NSPs because of distance and transportation issues, limited hours of operation, or disability issues • May increase disposal options for those who cannot or do not access fixed-site NSPs • Can respond faster than fixed sites to changes in local drug scenes and emerging groups
Disadvantages	<ul style="list-style-type: none"> • Size of mobile vehicle(s) determines the types of services that can be offered • Can provoke a negative community reaction based on beliefs that mobile NSPs attract people who use drugs to the community/new communities
Considerations	<ul style="list-style-type: none"> • Improve access: select locations and times not reached by other models of service delivery • Maximize impact: consider offering a full range of services and supports (i.e., advice on safer injecting practices, safer crack cocaine smoking equipment distribution and advice on safer smoking practices, overdose prevention and intervention, information on safer disposal of used drug use equipment, testing, vaccination, condom distribution, and facilitating access to substance use treatment and other services) • Staffing: consider hiring multidisciplinary staff to maximize the range of services that can be offered (e.g., counselling, education, medical and nursing care, peer support) • Uninterrupted service delivery: consider advocacy to build links and address concerns within neighbourhoods where mobile services will be provided
Pharmacy-based distribution and purchase	
Advantages	<ul style="list-style-type: none"> • Can be an important source of sterile needles/syringes and other harm reduction supplies because: <ul style="list-style-type: none"> – The venues are prevalent – Often easy to access and at convenient locations – Serve a diverse clientele – Have longer hours of operation – Are less stigmatizing or identifying of clients as people who use drugs – Provide greater anonymity – Have less police surveillance • May reach clients in areas where harm reduction services are limited, which is especially important in rural areas • Tend to reach lower-risk clients who do not access NSPs
Disadvantages	<ul style="list-style-type: none"> • Pharmacists and pharmacy assistants may lack training regarding how to respectfully engage with people who use drugs and assistants may discourage attendance • Concerns about thefts and other problems may limit willingness of pharmacists to consider offering harm reduction services and supplies • There is a lack of practice guidelines specifically for pharmacy-based NSPs • Pharmacies may not have the space to store equipment or be able to properly dispose of used equipment • Lack of privacy may limit opportunities for counselling

Considerations	<ul style="list-style-type: none"> • Improve access: identify pharmacy locations that can extend NSP services at times and locations not reached by other models • Improve knowledge of harm reduction for pharmacists and pharmacy staff: consider offering training and support • Maximize impact: advocate for display and sale of needles and syringes over the counter
Peer-based outreach	
Advantages	<ul style="list-style-type: none"> • Knowledge of and credibility within areas where people buy and use drugs • Increases the distribution of sterile drug use equipment • Meaningfully engages people who use drugs in harm reduction work • Reaches people who do not attend fixed-site NSPs • Can reach “hard-to-reach” groups including youth, women, sex workers, LGBTQ, Indigenous groups, and those who are new to injecting • Peers are often the best suited workers to provide street outreach and education
Disadvantages	<ul style="list-style-type: none"> • Peer workers may not be able to offer the full range of services and supports offered by health and social service providers • Ongoing training and supervision is required to ensure that peers are adequately supported and pass on accurate harm reduction information to clients • There have been a few reports of peers selling equipment to clients
Considerations	<ul style="list-style-type: none"> • Improve access: consider implementing formal peer-based outreach programs to take advantage of the high prevalence of secondary distribution that happens informally within drug-using networks • Peer staffing: select peer workers who are well connected within and knowledgeable about the community and who can reach clients not reached by other models and/or other staff members • Types of settings: streets, parks, homes, apartments, and other venues where people who use drugs gather • Maximize impact: provide peer workers with training (i.e., on sexually transmitted and blood-borne infections, overdose prevention and intervention, safer drug use and safer materials handling and disposal, and referral information) and ongoing personal and professional support, proper supervision, and a flexible management structure that can respond to their needs and/or challenges
Needle/syringe vending machines (NVMs)	
Advantages	<ul style="list-style-type: none"> • Can increase access at places and times with limited or no harm reduction services and/or where staffing is not feasible • May reach a group(s) of people who inject drugs who are less likely to be using other NSP models such as those who are younger, homeless, have lower socioeconomic status, and/or have injected for fewer years • Provide private and anonymous access for individuals who may be concerned about disclosing their drug-using status or who feel stigmatized by NSP or pharmacy staff • NVMs may be highly cost-effective, providing 24-hour service and minimal staffing costs
Disadvantages	<ul style="list-style-type: none"> • Limited in terms of provision of information, counselling, or referrals • Reliability and operational problems (e.g., breakage, jamming, and empty machines) have occurred in settings where NVMs are used • Costs of getting supplies from NVMs

Considerations	<ul style="list-style-type: none"> • Improve access: install where no other sources of safer injecting supplies exist and also outside fixed-site NSPs for after-hours access; machines need to be refilled and regularly maintained • Maximize impact and reduce potential risks: NVM delivery models would ideally be low-threshold with controlled access (i.e., not accessible to children), and with free or low-cost equipment
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Section III: Fixed-site NSPs

The term “fixed-site NSP” typically refers to NSPs that have static locations. Fixed site NSPs range from single offices to standalone buildings. In the North American, Australian, and UK literature, the term “fixed-site NSP” is predominantly used, but in most other countries the following terms are generally used: “needle exchange programs,” “syringe exchange programs,” “sterile injection equipment distribution programs,” “centre based needle exchange” or “drop-in centres.” These refer to fixed-site NSPs if other types of delivery are not specifically mentioned (e.g., mobile vans or buses, pharmacies, or vending machines). In this document, we use “fixed-site NSP” to indicate the fixed location delivery model.

Fixed-site NSPs are the most common model of delivery, and either exclusively distribute needles and syringes or operate in combination with other services (WHO, 2007). When located in a building or a community health centre, fixed-site NSPs are typically in a position to provide a wider array of services compared to other NSP delivery models. Commonly operating in larger spaces than other delivery models, fixed-site NSPs can offer access for multiple clients at once, with longer and more in-depth levels of interaction with staff and a greater degree of confidentiality. Most fixed-site NSPs incorporate and provide some, if not all, of the following services: equipment distribution and disposal, education about safer injecting practices, overdose prevention and intervention, testing and vaccination services, condom distribution, and referrals for substance use treatment and other services. Incorporating additional services (such as substance use treatment like methadone maintenance therapy) is sometimes possible at fixed-site NSPs.

Characteristics of people who attend fixed-site NSPs

Research shows that the majority of people who inject drugs obtain needles and syringes from fixed-site NSPs (NSWDH, 2008; WHO, 2007), but also typically access two or more delivery modalities (Miller et al., 2002).

Miller et al. (2002) reported findings from a prospective cohort study in Vancouver, showing that clients of fixed-site NSPs tend to engage in fewer risk behaviours than those who attend mobile NSPs but more risk behaviours than those who attend pharmacy based NSPs. In another study by MacNeil & Pauly (2010), the majority of participants who accessed fixed-site NSPs were homeless and living in poverty. A study in Glasgow (Cameron et al., 2004) concluded that fixed-site NSPs attracted more clients with a chaotic lifestyle, while pharmacy-based NSPs attracted more occasional users and new injectors, which is consistent with the findings from an older study in England (Sheridan et al., 1998).

Advantages of fixed-site NSPs

A major advantage of fixed-site NSPs is that, compared to other models, the physical size of the space can allow for a more comprehensive set of services and facilitates the distribution and disposal of injecting equipment (Cox & Robinson, 2008). Evidence reviewed above shows that needle and syringe distribution, on its own, without the support of additional services, is not enough to effectively prevent HIV transmission among high-risk populations. Implementing other services and models of service delivery can maximize the impact of fixed-site NSPs on reducing risk behaviours and, ultimately, transmission of HIV and HCV. Recent guidelines from the UK for NSPs issued by the National Institute for Health and Care Excellence (NICE, 2014) recommends offering a mix of services within NSPs, such as: advice on safer injecting practices, overdose prevention, information on safer disposal of used injecting equipment, testing services, vaccination, condom distribution, and facilitating access to substance use treatment and other services. These auxiliary services provide an added value to fixed-site NSPs for both meeting the needs of current clients and attracting new clients (Murphy & Murphy, 1998).

Anderson et al. (2003) have emphasized that the major advantage of fixed-site NSPs over “satellite” exchangers or “secondary exchangers” (people who have access to NSPs and distribute injecting equipment to other people who use

drugs) was their ability to provide additional ancillary services (first aid, HIV testing or advocacy) to people who use drugs. People who attended fixed-site NSPs were in a better position to benefit from psychological counselling and referral to social and medical services and education services.

Regarding disposal, a study in Glasgow (Cameron et al., 2004) compared levels of activity and profiles of users who attended pharmacy-based NSPs with other fixed-site NSPs. Rates of returned needles were the highest for fixed-site NSPs operated by a drug treatment service (92%), followed by pharmacy-based NSPs (85%).

Disadvantages of fixed-site NSPs

While fixed sites offer advantages in terms of range of services and a consistent location to access services, their fixed location can be a disadvantage if difficult to access and/or if hours of operation are restricted and not suitable for all subpopulations of people who inject drugs (EMCDDA, 2007; Griesbach et al., 2006; Moore et al., 2004; Chandler, 2008). A Glasgow study has shown that the majority of clients who were obtaining needles from 18 different NSPs (pharmacy, drug treatment sites, a drop-in service for female sex workers) accessed an NSP service that was operating 24 hours a day, seven days a week. Ability to access services at any time demonstrates the importance of extended working hours of the fixed-site NSP in attracting larger population of people who use drugs (Glasgow Involvement Group & Scottish Drugs Forum, 2005).

Other potential limitations of fixed-site NSPs include client fears of public exposure/ confidentiality concerns with attending a fixed location; stigmatization of people who use drugs by the local community; client mobility issues (e.g., physical disability, transportation issues); and fear of police (WHO, 2007). Further, drug scenes can change rapidly and move from one part of a city to another, and this could minimize the access to and impact of a fixed-site NSP. This type of limitation could be overcome by diversification of delivery models and NSP outlets such as vending machines, pharmacies, mobile units, and hospital departments (Cox & Robinson, 2008).

Location, setting, and community support considerations for fixed-site NSPs

A convenient location is one of the key factors that influences the effectiveness and uninterrupted functioning of the fixed-site NSP. The location itself very much determines the likelihood that people who inject drugs will access services

(UNAIDS, 2006). Prior to choosing the location and the size of a fixed-site NSP, multiple factors need to be taken into consideration. These include but are not limited to: the size of the local drug-using population and estimated number of people expected to visit the site, population density in the area, availability of public transportation, what services will be included at the site, and the number of staff to be employed (WHO, 2007). Fixed-site NSPs need to be tailored based on such local conditions, funding, and staffing availability.

Fixed-site NSPs vary in terms of setting. In a randomized controlled trial (RCT), Masson et al. (2007) directly compared the effects of different NSP settings (i.e., a typical free-standing community-based NSP versus a hospital-based program that was enhanced by education on safer injection practices) on health service utilization, injection practices, and client health status. Neither offered primary care but attendees of the hospital program could seek out additional services in that setting. The participants who were randomly assigned to a hospital-based fixed-site NSP had 83% more inpatient admissions and 22% more ambulatory care visits (i.e., outpatient visits) than those assigned to the community NSP. However, the type of fixed-site setting, whether it was hospital or community, did not influence risk behaviours, health status, or self-reported NSP use (Masson et al., 2007).

Community education, involvement, and support also play an important role in the functioning of fixed-site NSPs (Cox & Robinson, 2008; WHO, 2007). There are examples from across the world of NSP sites being closed or forced to change location as a result of community opposition (Tempalski et al, 2007; Strike et al, 2002; Klein, 2007; Lane et al, 2000; Downing et al, 2005). Therefore, involving community members, especially those from influential organizations in the community, can contribute to smoother NSP operations (WHO, 2007).

Complementing fixed-site NSPs with other delivery models

As noted earlier, complementing fixed-site NSPs with other service delivery models helps increase service coverage and access for different subpopulations of people who use drugs. Hyshka et al. (2012) conducted a review of peer-reviewed research on Vancouver's NSP from the last 15 years to understand the factors that contributed to the development of the program. This study concluded that removing syringe distribution limits and abandoning 1-for-1 exchange policies, and decentralizing and diversifying NSP services, eventually led to a decline in needle sharing and HIV prev-

alence. Diversification of NSP services in Vancouver meant extending beyond fixed-site distribution and establishing a mobile NSP, foot patrol, and secondary satellite distribution in order to increase access to sterile injecting equipment 24 hours a day.

Acceptance of fixed-site NSPs among people who access services

Only a few studies have assessed the model preferences of NSP clients. A study by Phillips et al. (2007) compared the views and attitudes of people who use drugs in England and the United States on the acceptability, advantages, and disadvantages of a broad range of harm reduction interventions. NSPs and drop-in centres were seen as acceptable by clients in these countries. MacNeil and Pauly (2010) examined the attitudes of people who accessed services in four fixed-site NSPs in the Greater Victoria region, British Columbia, and found that NSPs were perceived as important for HIV and HCV prevention and as important programs for reducing stigma and opening doors for marginalized populations to access other services. Further, a study in Glasgow (Glasgow Involvement Group & Scottish Drugs Forum, 2005) demonstrated that NSPs that were a part of addiction services were seen more favourably by clients than pharmacy-based NSPs across a number of categories: information provision, staff attitudes, privacy and confidentiality, safety, return policy, training for service users, and service provision/service demand.

Fixed-site NSP effectiveness and closure

There is a lack of research that evaluates the effectiveness of different NSP delivery models. This makes it challenging to determine the effectiveness of any single model, including fixed-site NSPs. The majority of studies published after 2000 focus on evaluating specific or tailored harm reduction services offered within fixed-site NSPs. Existing research on delivery models has mainly examined the characteristics of people who use certain delivery models, and has not focused on the overall effectiveness of specific delivery models.

A study by Ivsins et al. (2012) examined the impact of the closing of a fixed-site NSP in Victoria, British Columbia, on needle-sharing practices among people who inject drugs. These results were compared with the results from Vancouver, a nearby city that managed to maintain its continuum of NSP services. There was an increase of people who shared needles in Victoria from 10% in 2008 to 20% in 2010, while in Vancouver the rates of needle sharing remained relatively stable and low. People who inject drugs in Victoria ex-

pressed having more difficulties obtaining sterile injecting equipment since the NSP was closed. They also had a tendency to be more involved in high-risk practices than people who injected drugs in Vancouver. Recent injections of crack cocaine were also positively associated with high rates of needle sharing. As the study showed, the discontinuation of the fixed-site NSP in Victoria had a significantly negative impact on local injecting risk behaviours.

Fixed-site NSPs are also shown to be effective in reaching specific high-risk subpopulations of people who use drugs including homeless and marginally housed women (Magee & Hurlaux, 2008) and homeless and runaway youth (Al-Tayyib et al., 2014).

Fixed-site NSPs evidence summary

The evidence that informs this subsection came from predominantly observational studies and reviews. Cross-sectional studies were the main type of studies to contribute evidence on the characteristics and risk behaviours of people who use fixed-site NSPs. Several reviews, including one systematic review and one review of reviews, provide evidence regarding how complementing fixed-site delivery and/or adding other services to an existing NSP could contribute to maximizing effectiveness in terms of reducing the harms associated with drug use. Only one RCT was found that examined the impact of different types of fixed-site NSPs, hospital-based and community NSPs, on injection practices, health status, and health service utilization among people who inject drugs. Overall, limited research has been conducted on fixed-site NSP delivery model effectiveness when it comes to reducing injecting risk behaviours and HIV and HCV transmission.

Section IV: Mobile NSPs

Mobile NSPs operate from cars, vans, and buses; have fixed or flexible schedules; and act as drop-in facilities. Mobile NSPs can provide services to various local drug scenes. Mobile NSPs are an important way to scale up harm reduction coverage; that is, this model is used to reach people who use drugs at times and places that are not typically covered by fixed-site NSPs and other programs. The size of the mobile vehicle very much determines the number of services that can be offered. Even though the number of services provided through mobile outreach is typically less than through fixed-site NSPs, many mobile NSPs have incorporated some additional harm reduction services and might therefore be suitable for delivering tailored interventions to specific client subpopulations.

Characteristics of people who access mobile NSPs

Several studies to date have examined the characteristics of people who access different NSP delivery models (Miller et al., 2002; Obadia et al., 1999; Riley et al., 2000). Findings from these studies suggest that mobile van sites and vending machines tend to attract younger clients and people who use drugs with high-risk profiles. A study by Miller et al. (2002) demonstrated that mobile van users in Vancouver were more likely to be younger, Indigenous, and female compared to users who attended pharmacy or conventional fixed-site NSPs. Mobile van users tend to inject drugs more frequently and inject more frequently on the street, are more likely to engage in sex work, and are less likely to be enrolled in a drug treatment program (Miller et al., 2002; Riley et al., 2000).

A study by Riley et al. (2000) showed that a mobile van and a pharmacy-based NSP in Baltimore, Maryland, attracted different types of clients even within the same neighbourhood. The authors observed that when NSP provision was expanded from being only van-based to include pharmacy-based fixed-site NSP services, it attracted a different demographic and risk profile of people who inject drugs. Clients who used the mobile services were more likely to be cocaine injectors, to inject more frequently, and to use needles used by someone else. In New York City, a study by Turner et al. (2013) also showed that mobile units and community health clinics served higher-risk people who inject drugs.

Advantages of mobile NSP access

Mobile NSPs are able to reach people who use drugs at varied locations and times. Mobile access also allows for changing sites and neighbourhoods to be serviced according to changes in local drug scenes and can expand into other areas to cover additional or emerging groups of people who inject drugs. Therefore, mobile NSPs are in a position to respond faster than fixed-site NSPs to local changes. Mobile NSPs can often be reached at times and locations that are the most convenient for clients (i.e., in the evening, after fixed-site NSP operating hours). Mobile NSPs might also be the more appropriate delivery model for people who, for various reasons, do not want to or cannot access fixed-site NSPs.

One of the key factors of NSP success is its ability to establish and maintain contact with clients. Often people who inject drugs avoid formal service providers because operating hours and locations are not convenient, or because they perceive or have had experiences with service providers that are unhelpful and/or stigmatizing. Mobile outreach offers greater flexibility to meet people who use drugs and offer them services that most likely would not be accessed otherwise (Islam & Conigrave, 2007).

Disadvantages of mobile NSPs

Space limitations are a major constraint for mobile NSPs and therefore the services they provide largely depend on the size of the mobile unit. While many mobile sites can provide basic needle and syringe distribution services, long counselling and consultations, HIV and HCV testing, and service referrals might be challenging within smaller vehicles. NSP vans and buses can generate negative reactions from the neighbourhoods they service. It has been observed that community members may deny pre-existing drug use in their locale and blame the mobile NSP for attracting people who use drugs into the neighbourhood (Power, 2002; Strike et al., 2004). This belief is often combined with the belief that once mobile NSP services are discontinued, the problem will disappear. Such opposition can limit HIV prevention efforts and potentially lead to further discrimination and stigmatization of people who use drugs in a community (Strike et al., 2004). Building links with neighbourhoods where mobile services are to be provided and involving community partners in the planning process may address these concerns (Strike et al., 2004). Through that process, it is also important to raise awareness of the community's drug-related issues, inform residents about public health efforts, and explain the significance of NSP service provision on HIV and HCV prevention.

Effectiveness of mobile NSPs

Research that evaluates the effectiveness of mobile NSPs is limited. Most of the newer research on mobile NSP delivery is focused on assessing specific harm reduction services that are provided through mobile outreach. A mobile peer-led outreach NSP in Vancouver was successful in reaching a high-risk population of sex workers who use drugs (Janssen et al., 2009). Study data showed that from 2004 to 2006, the number of needles distributed increased almost three times (1,240 versus 3,241 per month), with an average number of 1,496 visits per month in 2006. In addition to needle distribution, Deering et al. (2011) found that an increasing number of sex workers who attended the peer-led mobile NSP showed interest in and accessed drug treatment (e.g., methadone maintenance therapy, addiction counselling, inpatient detoxification, and residential drug treatment/recovery houses). By providing testing through mobile outreach, it is possible to increase the detection of HIV and HCV in such populations (Fernandez et al., 2014).

A study by Pollack et al. (2004) showed that over a three-year period, the use of emergency department services significantly decreased among a population of mobile NSP clients, whereas emergency department use increased in the population of people who inject drugs and were not using mobile NSP services.

Incorporating auxiliary services into mobile NSPs to reach specific at-risk populations

Incorporating and providing additional harm reduction services through mobile NSPs may help reach different high-risk subpopulations of people who use drugs. Available, albeit limited, evidence suggests that the following subpopulations can benefit from mobile NSP and outreach services: men who have sex with men and use methamphetamine (Rose et al., 2006); former prisoners who use drugs (Bowler et al., 2010); sex workers who use drugs (Janssen et al., 2009); homeless people who use drugs (Nuttbrock et al., 2000); and young people who use drugs (Courty, 1999).

Mobile NSP distribution of safer crack cocaine smoking equipment

A program evaluation study in Ottawa demonstrated that the distribution of safer crack cocaine smoking equipment (i.e., glass stems, mouthpieces, brass screens, and chopsticks) through a mobile service attracted but had difficulty retaining clients (Leonard, 2010). Leonard (2010) notes a reduction

in smoking behaviours (i.e., pipe sharing) believed to pose a risk for HIV and HCV transmission after the introduction of the program.

Mobile NSP needle distribution policies and HIV transmission

A study by Heimer (2008) compared the impact of mobile NSPs in two US cities (New Haven, Connecticut and Chicago, Illinois) on reducing the number of subsequent HIV cases. The two mobile programs differed significantly in terms of needle distribution policies: the New Haven mobile NSP had a one-for-one exchange policy while the mobile NSP in Chicago had a less stringent distribution policy. The relative reduction in injection-related HIV cases as a function of all new HIV diagnoses was higher in Chicago than New Haven (41.4% versus 21.7%).

Expanding mobile NSP services

Adding other harm reduction services to mobile NSPs may help to reach and attract specific subpopulations of people who use drugs that are not covered by conventional or other NSPs. Expanding services through mobile outreach is typically done by adding services to existing needle and syringe distribution or linking clients with other services that are not readily provided through mobile outreach. These services may include: HIV and HCV testing; HBV vaccination; first aid courses for users; referrals to health and social services; and, in some countries, supervised injecting (see below).

Mobile NSPs and supervised injection

In Barcelona and Berlin, some mobile units are operating as mobile supervised injecting facilities (SIFs) in addition to already established fixed-site SIFs in these cities (Dietze et al., 2012). These mobile units were successful in reaching people who inject drugs. In 2010, the Barcelona van recorded 7,755 visits and the main Berlin van recorded 4,082 visits. As Dietze et al (2012) argued, mobile SIFs have a very limited number of injections per day (e.g., average of 11 per day in Berlin) compared to fixed-site SIFs (e.g., average of 172 per day in Sydney) with a similar staffing structure in both settings; therefore, the cost of running mobile SIFs is higher.

Mobile NSPs evidence summary

The evidence that informs this subsection came from predominantly observational studies and reviews. Cross-sectional studies were the main type of study drawn upon for evidence regarding the characteristics and risk behaviours of people who use mobile NSPs and outreach services, the role of auxiliary harm reduction services in mobile outreach, and coverage. Several review papers provided information on the advantages of mobile outreach in reaching high-risk populations and how additional harm reduction services delivered through mobile outreach and NSPs could help reach different subpopulations of clients. Overall, there is limited research on the effectiveness of mobile outreach specifically as a delivery model in terms of preventing injecting risk behaviours and HIV and HCV transmission.

Section V: Pharmacy-based distribution and purchase

In Canada and other high-income countries, pharmacies are both primary and supplementary sources of sterile needles and syringes for people who inject drugs. Pharmacies can be an important source of sterile needles because these venues are prevalent, often easy to access, and serve a diverse clientele. This is especially the case for rural areas where harm reduction services are often limited. Pharmacies therefore have great potential to complement other NSP models by providing increased access to harm reduction equipment, education, and drug treatment referrals for a diverse client base of people who use drugs. In Canada, over-the-counter (OTC) purchase of needles without a prescription is legal. Pharmacies are not yet a source of safer crack cocaine smoking supplies in Canada.

Pharmacists are encouraged by their professional regulatory bodies to display and sell needles and syringes over the counter; however, the decision to sell needles is at the discretion of individual pharmacists and/or their employer (Klein, 2007). Watson and Hughes' (2012) review of pharmacist practices and attitudes with respect to harm reduction claims that Canadian community pharmacists are the health professionals most accessible to the general public, but are underutilized as a source of harm reduction information and supplies. Watson and Hughes (2012) note that pharmacy-based programs are an important way to reach people who use drugs infrequently and may not access NSPs, and to provide points of access for marginalized populations (Watson & Hughes, 2012). However, pharmacists in Canada have expressed frustration at the lack of clear national policies to guide them in the provision of harm reduction services and health information to people who inject drugs (Watson & Hughes, 2012). The College of Pharmacists of British Columbia (2014) supports pharmacy distribution of harm reduction supplies.

A review of evidence by the WHO (2004) concerning the effectiveness of OTC sales of needles showed that this model of delivery was associated with reduced risk behaviours and HIV seroprevalence.

Canadian contexts of pharmacy-based NSP delivery

An evaluation of the Ontario Harm Reduction Distribution Program (OHRDP) surveyed people who use drugs (n=1,643) about their most common sources of needles and other injecting equipment. In 2008, 41% reported obtaining sterile needles from a pharmacy on at least one occasion, and 12% reported pharmacies as their most frequent source of ster-

ile needles (Leonard & Germain, 2009). However, few people reported ever using pharmacies to obtain sterile water (1.9%), filters (3.2%), cookers (0.4%), tourniquets (0.7%), acidifiers (0.6%), and alcohol swabs (9.5%).

In British Columbia, pharmacists can obtain free harm reduction supplies to distribute at no cost to people who inject drugs. Supplies are delivered to pharmacies by health authority staff, who also offer brief training as needed (College of Pharmacists of British Columbia, 2014). In Ontario, there were 24 pharmacies distributing free sterile injecting equipment through an OHRDP partnership (unpublished data, 2014). In Ontario's Leeds, Grenville, and Lanark District, the local health unit has maintained partnerships with several community pharmacies as a way to increase access to no-cost sterile injecting equipment in the region. The local health unit provides initial training to pharmacy staff and supplies the pharmacy with injecting equipment, although no formal partnership agreement exists (Giff, personal communication, 2013).

In other parts of Canada, local policies mandating pharmacy distribution of sterile injecting equipment have been established, such as in the region of Abitibi-Temiscamingue, in Northern Quebec (Canadian AIDS Society, 2008). Pharmacies in this region must provide as many kits of clean injection equipment as are requested, to anyone who requests them. Elsewhere in Quebec, the "Stop Sida UDI-pharmacies" program has been facilitating non-prescription syringe sale and disposal in Montreal pharmacies since 1996 (Leclerc et al., 2009). This initiative supplies pharmacies with pre-packaged kits containing four each of sterile needles/syringes, water, cookers, alcohol swabs, and condoms, which pharmacies can distribute for free or sell for no more than \$1.00 CAD. Pharmacies order kits directly from the suppliers and costs are paid by the municipal public health agency. Between April 2007 and March 2008, 67 pharmacies ordered 36,120 kits through this program, totaling 144,480 sterile needles, which accounts for almost 15% of the needles distributed in Montreal during that time period (Leclerc et al., 2009). This low- or no-cost model may account for the high proportion of needles distributed through pharmacies in the city, relative to other cities. Elsewhere in Canada, people who inject drugs have identified cost as a barrier to needle acquisition through pharmacies (Canadian AIDS Society, 2008).

OTC needle sales through pharmacies can complement existing NSP service delivery to increase needle and syringe coverage for people who inject drugs in Canada. However, there is currently no nationally coordinated program or incentive scheme to encourage pharmacies to distribute free

injecting equipment. This is an important consideration, as research has demonstrated that higher needle coverage is associated with no-cost distribution schemes. Participants in an Australian study (n=417) who accessed injecting equipment exclusively through pharmacies had significantly lower needle and syringe coverage than those who also used NSPs (OR 2.28 [1.44-3.61] $p < 0.001$) where they could obtain unlimited, no-cost syringes (Bryant et al., 2012).

Characteristics of people who obtain needles from pharmacies

Across a variety of studies, results show that people who use pharmacies to obtain needles and syringes tend to differ from those who attend NSPs. Canadian studies have found evidence for lower risk profiles among those who are more likely to acquire needles through pharmacies, although only a few studies of this nature exist. Evidence from other countries is mixed, although many studies report lower risk profiles among pharmacy users. Contradictory results may be due to differences in the availability of needles from alternative sources and the varying legal status of pharmacy OTC sale across study locations, particularly in the United States (Janulis, 2012).

In a study of 456 people who inject drugs in Montreal, 20% reported exclusive use of pharmacies to obtain needles and 18% used a combination of NSPs and pharmacies (Bruneau et al., 2008). Bruneau et al. (2008) found the lowest prevalence of high-risk injection practices among respondents who reported exclusive use of pharmacies (21%), with less than half the odds of high-risk injection behaviour compared to those using a mix of reliable and unreliable needle sources (44%). A study from Vancouver, in which only 6% of 1,020 participants reported using pharmacies as their primary source of needles, also found lower risk profiles among this group as compared to those who primarily used the fixed-site or mobile NSP (Miller et al., 2002). An older study by Strike et al. (2005) reported that pharmacies are a preferred source for some people who inject drugs. A qualitative study from Atlantic Canada found that most individuals living outside of urban centres reported pharmacies as their most frequent source of injecting equipment, whereas urban residents were more likely to report NSPs as their most frequent or exclusive source (Parker et al., 2012). These findings show the importance of pharmacy access to sterile injecting equipment for non-urban communities in Canada where NSPs are less common.

A cross-sectional study of 285 people who inject drugs in New York City compared the socio-demographic characteristics and injection behaviours of those who accessed nee-

dles from pharmacies, NSPs, and primarily other sources (Rudolph et al., 2010). Participants using pharmacies most often were significantly less likely to inject daily compared to those who reported NSPs as their main source (38% and 56%, respectively). Another study from New York surveyed 62 OTC needle purchasers, of whom 74% reported buying needles for injection drug use (Battles et al., 2009). Two thirds reported reusing needles and 80% injected at least once per day, although a small percentage reported sharing needles (Battles et al.). Data from the US shows that people who obtain needles from pharmacies for injection drug use are less likely to be Black compared to those using other sources (Rudolph et al., 2010) and that Black people are less likely than whites to purchase needles from pharmacies (Cooper et al., 2009; Costenbader et al., 2010). Another study found that people using less reliable sources (i.e., not a pharmacy or NSP) were significantly more likely to be homeless (Riley et al., 2010). Women who inject drugs have reported a preference for obtaining needles from pharmacies over NSPs (Fisher et al., 2003; Junge et al., 1999); however, many studies have found no significant gender differences (Janulis, 2010).

In Australia, a study conducted by Bryant and Treloar (2006) found that people who inject drugs and obtain needles from pharmacies were more likely than those acquiring needles from personal networks to live in stable housing, to identify as heterosexual, and to inject opioids. Another study by Bryant et al. (2010) showed that those reporting exclusive use of pharmacies were more likely to be heterosexual and were less likely to have received drug treatment or a recent HCV test compared to those who exclusively used NSPs or used both. Data from 2003 found similar rates of needle reuse among both pharmacy users and those who used personal networks to obtain needles (Bryant & Treloar, 2006). However, a later study found that exclusive pharmacy users were more likely to report receptive sharing of needles (i.e., accepting needles from other individuals) and other equipment (adjusted OR 5.9 [2.02–17.14]; Bryant et al., 2010). A Welsh study found that individuals who reported using pharmacies most frequently were less likely to report markers of increased injection risk (i.e., groin injection, injecting more than 16 days per month, and homelessness) compared to those primarily using NSPs (Craine et al., 2010).

Factors influencing use of pharmacies and OTC needle purchase

The majority of people who inject drugs do not use one exclusive needle source, but report using a combination of sources such as NSPs, pharmacies, friends, strangers, and

drug dealers (Battles et al., 2009; Bryant et al., 2010; Lilley et al., 2013). Although access to needles through pharmacies typically requires payment, whereas NSPs distribute for free, there are a number of factors that influence the use of pharmacies over NSPs, including: longer hours of operation, convenient locations, less stigmatizing or identifying locations, greater anonymity, and less police surveillance (Khoshnood et al., 2000; Strike et al., 2002; Treloar, 2010). The Canadian AIDS Society (2008) has highlighted that people who inject drugs appreciate having the option to purchase needles from pharmacies, especially in areas where there are no needle distribution services available, such as in many rural areas of Canada.

Research from countries with a long history of pharmacies participating in OTC needle sales has demonstrated that pharmacies play an important role in needle and syringe provision, although they are unlikely to be the preferred model when other NSP options are available. Lilley et al. (2013) mapped the nature and growth of needle and syringe distribution over a 20-year period in Western Australia, where sterile injecting equipment was first made available through pharmacies in 1987. From 1990 to 2009, the proportion of needles and syringes distributed through pharmacies decreased from 67% to 28%, and has been declining since 2001/2002, while fixed and mobile models experienced significant growth (89% and 85% respectively) between 2001 and 2006 (Lilley et al., 2013). The authors suggest that even though pharmacies provide widespread coverage and are conveniently accessible, they are not the preferred model in the region. Similarly, in a Swiss region where sterile injection equipment was only accessible through pharmacies prior to 1996, the proportion of needles distributed by pharmacies decreased from 62% to 20% between 1996 and 2002, while NSPs experienced an increase in distribution (Samitca et al., 2007).

Countries such as New Zealand and Scotland have centrally coordinated and well-funded programs that engage with and support pharmacies to provide needle and syringe distribution effectively (Matheson et al., 2007; Sheridan et al., 2005; Watson & Hughes, 2012). In the UK, local health authorities organize pharmacy-based NSPs. Pharmacists are provided with equipment and are remunerated for providing NSP services at no cost to the clients (Sheridan et al., 2000). Watson and Hughes (2012) suggest that pharmacies in Canada may be better able and willing to provide needle distribution services if policies, programs and partnerships are implemented to provide support, guidance, and remuneration to participating pharmacies.

Barriers to OTC needle purchase for people who use drugs

In Canada and elsewhere, cost has been identified as a barrier to needle access through pharmacies (Canadian AIDS Society, 2008; Bonnet, 2006; Bryant et al., 2010; Treloar et al., 2010). However, the most commonly reported barriers to pharmacy needle access relate to negative experiences with pharmacists or pharmacy staff and OTC sale refusals. Reported negative experiences include poor treatment, feeling judged, inappropriate attitudes of pharmacy staff (Klein, 2007; Lutnick, Case et al., 2012; Treloar et al., 2010), and negative interactions with pharmacy security staff (Hall & Matheson, 2008). A 2010 summary of literature on NSPs and the role of pharmacists identified pharmacist attitudes and beliefs about people who use drugs as important barriers to implementing NSPs within pharmacies; this is in addition to laws, regulations, and a lack of practice guidelines (Nacopoulos et al., 2010).

One Vancouver study cited OTC refusals as the main barrier for people trying to purchase injection equipment from pharmacies (Wood et al., 2002). There are reports of pharmacists in Canada who refuse to sell needles to people who use drugs or who impose barriers such as requiring a prescription (Klein, 2007). The Ontario College of Pharmacists has recognized OTC needle sales as a contentious issue within the profession (Klein, 2007). Some conditions imposed by pharmacies to discourage OTC needle purchase include requiring proof of medical condition, diabetic status, or other justification for obtaining needles; asking for photo identification; and refusing to sell small quantities of needles (Cooper et al., 2010; Finlinson et al., 2006; Treloar et al., 2010).

Several studies from California have investigated needle sale refusals since OTC needle sales became legal. Cooper et al. (2010) reported that in 2007, 25% of pharmacies refused to sell needles sometimes or often (Cooper et al., 2010). A 2010 study in Los Angeles reported that every pharmacy visited refused to sell a single syringe (Lutnick, Cooper et al., 2012). These findings are concerning because a San Francisco study showed that unsuccessful attempts to purchase needles at a pharmacy (n=105 people who use drugs) increased the odds of both receptive sharing (OR 12.00 [2.79-51.66]) and distributive sharing (OR 9.32 [1.73-50.19]; Riley et al., 2010). A study from New York found that men, Black people, and Hispanic people were more likely to be refused when attempting to purchase needles at a pharmacy than women and white people (Battles, 2009). However, Zaller et al. (2012) reported that in a survey of 150 people who inject opiates, women were more likely than men to report feel-

ing uncomfortable when purchasing syringes from pharmacies (86% and 67%, respectively).

Pharmacist and pharmacy staff attitudes towards OTC sales and needle distribution

Watson and Hughes' (2012) review found that, in general, pharmacists have a positive attitude towards providing harm reduction services and some are interested in increasing their role in this area. While some pharmacists already play a key role in providing access to needles, others are reluctant because of concerns about encouraging drug use, the risks of improperly discarded needles, shoplifting, and/or the risk of alienating other customers (Gleghorn et al., 1998; Lewis et al., 2002; Myers et al., 1998; Reich et al., 2002; Weinstein et al., 1998).

There is little data about the attitudes of Canadian pharmacists toward OTC needle sales, and the most recent available data is from the early 1990s. Between 1992 and 1993, Myers et al. (1998) conducted a national mail survey of Canadian community pharmacists' (n=1,976) attitudes and practices with respect to harm reduction interventions. Overall, 73% supported needle exchange for people who use drugs; however, only 20% said that they would sell needles in response to all requests. Factors noted to influence willingness to sell needles to people who did not have diabetes included attitudes towards injection drug use, personal support of needle exchange, perceived threat of robbery, and concern about public health.

Telephone and in-person interviews with 238 pharmacies in California found that pharmacists were more likely to report OTC needle sales if they thought it was effective in preventing HIV or HCV transmission and if HIV was a health issue in their location (Cooper et al., 2010). Successful attempts to purchase OTC needles in randomly selected pharmacies in Washington state (n=227) were more likely to happen within chain than independent pharmacies (Deibert et al., 2006). As well, chain pharmacies have been reported to be more likely to sell needles than independent pharmacies in California (Cooper et al., 2010).

Pharmacy support staff are often in direct contact with pharmacy customers and can influence how services are delivered to people who use drugs and other pharmacy clientele. A qualitative study of pharmacy support staff in the UK showed that many held negative attitudes towards people who use drugs and associated services, and many had misunderstandings about the intended outcomes of these services (Mackridge & Scott, 2009). A postal questionnaire

of pharmacy support staff (n=1,976) from the same region found that average attitude scores were significantly more positive among those working in pharmacies providing services to people who use drugs compared to those who did not (Scott & Mackridge, 2009). This was especially the case for attitudes towards direct work contact with these clients (Scott & Mackridge, 2009).

Pharmacist concerns about selling OTC needles

When pharmacists were asked about what may deter OTC needle sales in their pharmacies, reported concerns related to the perceived potential for a negative impact on the business (e.g., increase in thefts, deterrence of other customers) and/or the safety of pharmacists and other staff (e.g., mugging, aggressive customers, needle-stick injury; Deibert et al., 2006; Hall & Matheson, 2008; Roberts et al., 2007; Samitca et al., 2007). However, these concerns are largely unfounded. A review of literature on pharmacists and harm reduction programs suggests that, in practice, OTC needle sales do not increase criminal activity in pharmacies, nor do they deter clientele out of fear or discomfort (Watson & Hughes, 2012). The majority of pharmacists participating in OTC needle sales report no problems related to providing the service or the clients it attracts (Cooper et al., 2010; Le & Hotham, 2008; Samitca et al., 2007; Sheridan et al., 2000; Torre et al., 2010). Problems reported by a minority of pharmacists and pharmacy support staff include verbal abuse, problematic behaviour, and theft (Cooper et al., 2010; Mackridge & Scott, 2009; Samitca et al., 2007; Torre et al., 2010). Lack of space needed for equipment storage and private counselling is also reported as a reason for not offering needle and syringe distribution (Hall & Matheson, 2008; Roberts et al., 2007). Finally, despite willingness to offer OTC needles and services to people who inject drugs, some pharmacists cite lack of time, lack of training, and lack of communication with other NSP providers as barriers to pharmacy distribution of harm reduction supplies (Hall & Matheson, 2008; Watson & Hughes, 2012; Zaller et al., 2010).

Pharmacy participation in needle and syringe disposal

Pharmacies may also be a point of needle and other equipment disposal for people who use drugs. Limited research on pharmacist attitudes and practices regarding needle disposal indicates that pharmacies may be willing to provide disposal and distribute sharps containers; however, very few offer these services. Some pharmacists cite increases in unsafe needle disposal as a reason for opposing needle and syringe provision in pharmacies (Janulis, 2012; Kral & Garfein, 2010;

Watson & Hughes, 2012) and one study cited lack of space for disposal as a related concern (Hall & Matheson, 2008). A review of pharmacy needle distribution has reported a “general unwillingness to receive used syringes or sharps containers” (Janulis, 2012). Zaller et al. (2010) reported that 68% of pharmacists and pharmacy staff surveyed who sold needles (n= 146) agreed or strongly agreed that they would support syringe disposal at their pharmacy. A study from California (Lutnick et al., 2010) found that only 9% of pharmacies registered to participate in OTC needle sales offered a disposal service (by providing sharps containers). Another study from San Francisco found a very small number of people who inject drugs using pharmacies for disposal (2%), despite 39% of respondents reporting pharmacies as a syringe source (Riley et al., 2010). One study found that people who inject drugs are very supportive of needle disposal through pharmacies, although they expressed concerns around discretion and privacy (Lutnick, 2012).

Training for pharmacists and pharmacy staff

Research has highlighted the importance of training about harm reduction, the nature of drug use and addiction, and the availability of services for testing and treatment referrals for pharmacists and pharmacy staff who provide services to people who inject drugs (Bryant et al., 2010; Mackridge & Scott, 2009). In a postal survey of 898 New Zealand community pharmacists, only 26% reported previous training on opioid use and associated issues (McCormick et al., 2006). This study found that having or wanting training was positively associated with higher attitude scores in four areas related to providing services for people who use drugs: methadone outcomes, effect on pharmacy image, harm reduction through NSPs, and engagement with people who use drugs. Among pharmacy support staff, Scott and Mackridge (2009) reported that those who had undertaken training related to service delivery for people who use drugs were significantly more likely to want future training compared to those who had not received any training. Scott and Mackridge (2009) also found that previously trained individuals who worked in a pharmacy providing harm reduction services had significantly more positive attitude scores ($p<0.001$) than those who had not been trained at all and those who had received training but worked in pharmacies not providing services to people who use drugs.

A study conducted in racial/ethnic minority neighbourhoods of New York City with high levels of drug activity randomized 88 pharmacies participating in OTC needle sales into one of three groups (Crawford et al., 2013). The first group

received training about drug dependence and best practices for providing harm reduction, HIV prevention materials and expanded services (e.g., syringe sales, HIV testing, influenza vaccination; $n=26$ pharmacies) to syringe customers who inject drugs. The second group received training about how to engage people who inject drugs to buy syringes in the pharmacy ($n=29$). The third group received no training ($n=33$). Data collected 12 months later showed significantly higher support for OTC needle sales among pharmacy staff in the intervention and training groups. There was no increased support for pharmacy-based HIV testing or influenza vaccination among any of the groups.

Evidence of the effectiveness of pharmacy needle distribution to prevent HIV and HCV transmission

A 2010 review of reviews (Palmateer et al., 2010) evaluated evidence for the effectiveness of sterile injecting equipment provision to prevent HIV and HCV transmission among people who inject drugs. It found only tentative evidence for reduced injection risk behaviour from increased access to syringes through pharmacies, and weak evidence for decreased HIV prevalence (Palmateer et al., 2010). Notably, this conclusion is drawn primarily because the majority of studies reviewed used observational study designs. However, many researchers have concluded that it would be unethical to withhold sterile syringes from a control group in an experimental study design, and that evidence from observational studies should not be discounted (Bluthenthal & Kral, 2010).

In the US, where pharmacy OTC needle sales were not legal in many states until relatively recently, research has evaluated the impact of syringe law liberalization on injection behaviour among people who inject drugs. In a study from New York, Cooper et al. (2011) found a significant increase in the odds of using a sterile syringe for at least 75% of injection events after legalization as compared to before (OR 3.61, 95% CI=2.17, 6.02). Prior to a community intervention conducted in Harlem, New York, pharmacists were more likely to say they did not support pharmacy OTC needle sale, and a higher proportion reported selling needles afterwards (Fuller et al., 2007). This intervention attempted to increase access to sterile needles for Black and Hispanic people who inject drugs by educating pharmacists, community residents, and people who use drugs, about the positive health effects, the changes in needle sale law, and to dispel negative associations of people who use drugs. Pre- and post-intervention there was a significant increase in reported pharmacy use among Black and Hispanic people who inject drugs (5% to 22%, $p<0.02$ and 15% to 34%, $p<0.005$, respectively), and an overall decrease in report-

ed syringe reuse (26% to 16%, $p<0.03$). These findings suggest that providing training and awareness raising education for pharmacists and community members, including people who use drugs, can help to increase the accessibility of sterile syringes through pharmacies.

Pharmacy-based distribution and purchase evidence summary

The evidence that informs this subsection came from predominantly observational studies. Cross-sectional studies were the main type of study to contribute evidence for this chapter, providing information on pharmacist (and pharmacy staff) attitudes and practices, availability of sterile needles through pharmacies, and characteristics and/or risk behaviours of people who acquire syringes from pharmacies. A few prospective cohort studies were used for evidence on access to sterile syringes and corresponding risk profiles. Studies using qualitative methods provided greater insight into the perspectives of people who use drugs and the factors influencing their access to syringes through pharmacies, and the attitudes and experiences of pharmacists and pharmacy support staff. Several non-randomized community interventions provided information on the feasibility of pharmacy syringe exchange as a method of increasing access to sterile syringes. Review papers, including one review of reviews, provided information on the attitudes and behaviours of pharmacists and clients and the effectiveness of pharmacy-based syringe distribution on HIV and HCV risk and transmission. Canadian grey literature and unpublished sources (i.e., distribution monitoring reports, evaluations, program reports and personal communications) were consulted to provide additional evidence for service provision within a Canadian context. We did not find reports of RCTs or other experimental designs that were applicable for this subsection.

Section VI: Peer-based outreach

A peer-based delivery model involves the provision of harm reduction program services to people who use drugs by peers with current or former lived experience of drug use. Using peer-based models helps to increase the distribution of sterile drug use equipment to areas where people buy and use drugs. Peer-based outreach builds on existing social networks and community norms of reciprocity. It represents one way, but not the only way, to meaningfully include people who use drugs in harm reduction work. Peer outreach programs may be self-run, integrated within a larger harm reduction program (where peers may work alongside other staff), or conducted from homes and/or on the street. Many peer-based programs use outreach services to reach people who do not attend fixed-site harm reduction locations.

The World Health Organization ([WHO] 2004, 2007) recommends community-based outreach to provide supplies, education, and referrals to people who use drugs where they live, use and/or buy drugs as an important component of effective needle and syringe programs (NSPs). A literature review conducted by the WHO (2004) notes that NSP outreach is associated with reductions in HIV risk behaviours among people who inject drugs, and that peer-based outreach may be correlated with greater reductions compared to outreach provided by other workers. Peer outreach and peer education provided outside of traditional service settings and regular working hours can be useful strategies for maximizing access to sterile equipment and harm reduction information. Streets, parks, apartments, and other venues where people who use drugs gather can be optimal locations for service delivery and some might be best reached by peers. Peer-based strategies can help to increase access for certain marginalized populations of people who inject drugs such as youth, women, sex workers, and those who are new to injecting (WHO, 2007).

Formalized peer-based programs

A systematic review showed that peer workers (i.e., people who inject drugs or have done so in the past) perform a variety of roles within NSPs and other harm reduction initiatives, including acting as harm reduction educators; delivering harm reduction services and equipment; providing support, counselling, and referrals; and serving as research assistants and members of advisory committees (Marshall et al., 2015). These roles vary from informal to formal and also from low engagement to high levels of participation (Marshall et al., 2015). Below we summarize literature that describes and evaluates peer programs.

In Vancouver, a community-based research project designed to describe and evaluate a peer-driven outreach program found that it effectively reached a vulnerable and underserved population of people who inject drugs and who experience barriers in accessing local harm reduction services or facilities (Small et al., 2012). The Vancouver Area Network of Drug Users (VANDU) initiated the Injection Support Team (IST) to promote safer injecting practices through peer-based education and instruction in Vancouver's open drug scene and for those who are unable or unwilling to attend the city's supervised injection facility (SIF). IST members trained in CPR, first aid, safe injection, and overdose identification and response spend 2 to 3 hours, five days a week, doing outreach in the open drug scene where public injection frequently occurs. The team distributes sterile injecting equipment, administers first aid, and provides safer injecting education to individuals who require assistance injecting. IST members are established "hit doctors" who are recognized and trusted by many people who inject drugs in the community. In qualitative interviews, individuals who had accessed the support of the IST expressed that these interactions were beneficial towards facilitating safer self-injection, and many reported being referred or referring others to the IST. Minimal resources limited the ability of the IST to increase the duration and number of outreach shifts, although a desire for program expansion, especially for late-night shifts, was expressed.

Using data from the Vancouver Injection Drug Users Study (VIDUS), an ongoing prospective cohort, Hayashi et al. (2010) evaluated the VANDU Alley Patrol, a peer-run outreach-based program that operated from 2000 to 2005. The program consisted of trained peer volunteers who conducted 4-hour outreach shifts during the day and/or night to distribute harm reduction equipment and provide education to people who use drugs in public spaces. Of 854 individuals included in the analyses, 27.3% reported ever having obtained needles from the VANDU Alley Patrol. Hayashi et al. found that the program was successful in reaching a subpopulation of people who inject drugs that are at high risk of HIV infection. Use of the program was significantly associated with unstable housing, frequent heroin injection, frequent cocaine injection, public injection, and there was an inverse association with needle reuse (Hayashi et al., 2010).

In Victoria, the Society of Living Intravenous Drug Users (SOLID) offers a peer-based outreach program that provides training to current and former people who use drugs about HIV and HCV prevention, mental health and addictions, safer drug use and self-advocacy (BCCDC, 2008). Peers are

paid for training and work outreach shifts that they conduct on foot in the streets during early morning hours when no other NSP services are operating. During outreach shifts, peers distribute sterile injecting and safer crack cocaine smoking equipment, and provide harm reduction information and referrals.

Drach et al. (2011) reported results from a pilot program in Portland, Oregon, that trained NSP clients who reported participating in secondary distribution of needles to other people who use drugs. The intervention trained and provided 17 peer educators with an additional box of 200 syringes at three separate training sessions. Of those who participated in follow-up interviews (n=16), 87% reported receiving and distributing more needles than they had to exchange, and 44% reported expanding their distribution networks. The volume of needles distributed in the community nearly doubled, as the peer educators increased their needle distribution from a reported median of 712.5 (range: 50-4,800) to 1,500 (range: 200-9,000) in the previous two months, highlighting the importance of unrestricted distribution policies that actively engage secondary distribution (Drach et al., 2011).

Davidson et al. (2011) described a GIS-based approach that was piloted in California and used to identify local areas with high concentrations of people who are underserved by existing NSP services. They conducted a cross-sectional survey with small convenience samples at two different NSPs (n=18 and 24, respectively) to determine locations where people frequently run out of needles, and used this information to create GIS maps which identified local “hot spots.” This information was used to design local solutions for targeting the identified underserved populations and led to peer-based targeted outreach activities within “hot spots.”

Peer workers

Many NSPs employ a mix of people who may have lived experience of drug use or no history of drug use. NSP roles should be divided in a way that maximizes workers’ strengths, and peers are often the best-suited workers to provide street outreach and education (WHO, 2007). The WHO recommends that peers who are actively using drugs and are stabilized on an opioid substitution therapy or former users can also be effective harm reduction workers. However, Balian and White (2010), in a manual prepared for the Open Society, advocate the many benefits of hiring and engaging people who are active users. These benefits include but are not limited to: demonstrating commitment to people who use drugs; showing that peers can become

role models for other clients; peers are effective to deliver public health messaging; providing direct access to peer knowledge of the local scene; improving the self-esteem of peers; helping peers gain employment skills; and contributing to a sense of belonging in the community. Both the WHO (2007) and Balian and White (2010) recommend that peer workers should be provided with training, ongoing personal and professional support, proper supervision, and a flexible management structure that can respond to their needs and/or challenges. Training content can vary depending on the context and objectives of the harm reduction program and the training needs of workers, but should address the following issues: program purpose, target populations, HIV and HCV risk behaviours, safer injecting and safer sex practices, job responsibilities, boundaries, and first aid (WHO, 2007).

Based on a systematic review of the facilitators and barriers related to peer involvement in harm reduction programs, Marshall et al. (2015) identify many approaches to improve peer involvement, such as: addressing criminalization; engaging in drug-related anti-stigma campaigns; bringing policy makers and practitioners together to discuss harm reduction; devoting time and effort to creating positive rapport with decision makers, gatekeepers, and the public; encouraging organizational cultures that support leadership roles and meaningful participation of peers; designing programs that are grounded in lived experience and that recognize the importance of peer networks; training and supporting workers; and reducing structural and other barriers to peer worker participation.

Informal programs and secondary distribution

Many people who use drugs assist other peers in their communities with equipment acquisition and other needs, regardless of whether or not a formalized peer-based distribution program exists. Informal peer-based distribution involves the acquisition of large amounts of sterile injecting or smoking equipment by people who use drugs from a primary source (i.e., NSP or pharmacy) in order to give, sell, or trade these materials to other people who use drugs. Those who engage in informal distribution to peers are often called secondary or satellite exchangers, secondary distributors, peer exchangers, or natural helpers. This practice is often encouraged by programs even when the practice is not formalized within an NSP (Des Jarlais et al., 2009).

In addition to NSP and other primary sources, people who use drugs report obtaining equipment from (and providing equipment to) friends, acquaintances, sexual partners,

family members, drug dealers, and strangers (Bryant & Hopwood, 2009; Bryant & Treloar, 2006; De et al., 2007; Fisher et al., 2013). Research on secondary peer exchange shows that a high proportion of people who use drugs participate in distributing or receiving sterile needles from peers. In a Vancouver study, Kuyper et al. (2006) found that 64% of people who injected drugs (n=468) reported giving away syringes obtained from an NSP to other people. A study from California reported that 75% of 539 people who inject drugs had participated in secondary exchange in the previous six months, with 41% reporting distribution only, 15% receiving only, and 44% reporting both distributing and receiving sterile needles (Lorvick et al., 2006). Bryant and Hopwood (2009) found that 54% of their sample of 229 people who inject drugs reported secondary exchange (40% distributing only, 25% receiving only, and 36% both) in the past month. This study also found that participants redistributed 22% of their sterile needles to others, and recipients reported receiving a median of 5 needles at each exchange. Another study found that, of 118 people who regularly distribute sterile needles to peers, 51% reported regular distribution to between 2 and 4 other people, and 27% reported distributing to more than 5 other people (Fisher et al., 2013). Research suggests that selling sterile needles to peers is much less common than giving them away for free (Kuyper et al., 2006; Latkin et al., 2006; Lorvick et al., 2006), and that those who engage in needle selling may have higher-risk profiles (Kuyper et al., 2006; Latkin et al., 2006).

People who use drugs report obtaining needles from another person because of convenience, inability to attend an NSP for various reasons (i.e., drug-related physical or mental state or lack of transportation), and fear of stigma or harassment at an NSP (De et al., 2007). People report engaging in secondary distribution in order to help prevent risky injection practices (Bryant & Hopwood, 2009), help others avoid getting HCV, help those who cannot travel to an NSP, and help others avoid embarrassment, with very few reporting participation for financial gain (Fisher et al., 2013). There is limited evidence that peers who engage in secondary distribution also pass on harm reduction information to those to whom they distribute needles (Bryant & Treloar, 2006; Fisher et al., 2013).

Although several studies have found that secondary exchange is an informally encouraged practice in many NSPs (Bryant & Hopwood, 2009; Des Jarlais et al., 2009), concerns exist regarding the lack of face-to-face contact with health and social service providers, improper disposal, the accuracy of harm reduction information being passed on, and the po-

tential for people to profit from selling equipment funded by the public (Bryant & Treloar, 2006; Coffin et al., 2007; Green et al., 2010; Lenton et al., 2006). Researchers of secondary distribution recommend that NSPs implement formal peer-based outreach programs to take advantage of the high prevalence of secondary distribution that happens informally within drug using networks, and to reach individuals with low levels of formal service access (Bryant & Hopwood, 2009; Craine et al., 2010; Kuyper et al., 2006). Furthermore, with formalized programs, peers can be trained to educate others about HIV prevention, safer drug use, overdose prevention and intervention, and safer handling and disposal of materials (Latkin et al., 2006; Lorvick et al., 2006), thus alleviating some concerns including lack of contact with service providers and incorrect harm reduction information.

Peer-based outreach evidence summary

The evidence that informs this subsection came from qualitative studies, observational studies, cohort studies, process evaluations, program descriptions, and opinion papers. Evidence from qualitative and cross-sectional studies was used to characterize those who access and/or deliver peer outreach and secondary syringe exchange services, reasons for accessing peer workers, and the barriers to accessing other NSP service models. Process evaluations contributed to evidence about equipment distribution practices of peer workers. Opinion papers and a WHO manual offer recommendations regarding the characteristics and skills necessary for peer workers as well as hiring practices.

Section VII: Needle/syringe vending machines

Worldwide, there are an estimated 14 countries (including Australia, New Zealand, and numerous European countries) that use needle/syringe vending machines (NVMs) to deliver and collect sterile needles among people who inject drugs (Islam & Conigrave, 2007). The literature predominantly uses the term “syringe vending machines” (SVM); however, “NVM” will be adopted here for consistency, as “needles” is the term used throughout this document. At the time of writing, NVMs had not been used in Canada for needle exchange or distribution (Klein, 2007). Typically, NVMs mechanically dispense sterile injecting kits consisting of several needles and other equipment such as alcohol swabs, cookers, water, and cotton filters when payment or a used needle is inserted into the machine (Islam et al., 2009; McDonald, 2009). Most sterile injecting kits also include safer injecting information, and some include a sharps container for proper disposal of used injecting equipment (Islam & Conigrave, 2007). Machines have been installed on the outside walls of fixed-site NSPs or community health centres in both urban and suburban settings, and can be installed where no other sources of safer injecting supplies exist.

Characteristics of people who are more likely to use NVMs

Evidence suggests that NVMs attract a different clientele than other NSP models. Relative to clients of other NSP models, clients of NVMs are more likely to be younger, homeless, have lower socioeconomic status, have injected for fewer years, have less contact with other health services, and are less likely to be using other NSP models or receiving opioid substitution treatment (Islam & Conigrave, 2007a, 2007b; Islam, Stern et al., 2008; Islam, Wodak et al., 2008; Jones et al., 2010; McDonald, 2009; Moatti et al., 2001; Obadia et al., 1999). A cross-sectional survey of 167 NVM users in Sydney found that 71% of younger respondents (<30 years of age) used NVMs as their primary source of injecting equipment, and only 29% reported using staffed NSPs the majority of the time, compared to older participants (>30 years of age) among whom 49% preferred NVMs (Islam, Stern et al., 2008). The evaluation of a year-long trial of NVMs in Canberra, Australia, collected questionnaires from 147 NVM clients and found that respondents were more likely to be female compared to national survey data of NSP users (43% vs. 36%, respectively), in addition to being younger (McDonald, 2009).

Advantages of access to needles through NVMs

As noted above, NVMs complement other NSP delivery models by reaching a different segment of people who in-

ject drugs (Islam & Conigrave 2007a). Vending machines increase geographic coverage and temporal availability while providing private and anonymous access for individuals who may be concerned about disclosing their drug using status or who feel stigmatized by NSP or pharmacy staff (Islam & Conigrave 2007b; Islam, Wodak et al., 2008). Furthermore, NVMs can be discreetly installed in locations where staffed NSPs are less feasible, or in areas with strong opposition to highly visible NSPs (Islam & Conigrave 2007b).

Two separate studies examining client perspectives of NVMs identified similar reasons for accessing equipment through machines. NVM clients from both studies most commonly reported using machines because of greater temporal availability and geographical convenience, and because they did not like using other NSP outlets or felt stigmatized by NSP or pharmacy staff (Islam, Stern et al., 2008; McDonald, 2009). In a survey of 167 NVM users, Islam et al. (2008) found that 51% reported exclusively accessing the machines between the hours of 5 pm and 9 pm, when most other outlets were closed. They also found that 46% of respondents were using the machines weekly. Furthermore, clients who reported accessing NVMs the majority of the time were 9.5 times more likely to identify stigma as a reason for using machines, compared to those who primarily accessed NSPs or pharmacies ($p < 0.01$). McDonald (2009) reported that NVM clients in their study included both people who used NSPs and those who did not access NSPs to obtain sterile equipment, suggesting that vending machines provide the only safe source of sterile equipment for a segment of NVM users. In this sample, 59% of respondents used NVMs as their primary source of injecting equipment, and 40% reported accessing NVMs for equipment daily or almost daily.

In a cross-sectional, interviewer-administered questionnaire of 294 Australian respondents who did not use NSPs as their primary source of injecting equipment, 75% considered vending machines to be one of the best sources of sterile needles, preferring them over NSP outreach, home delivery, and obtaining needles from other health service providers (Treloar & Cao, 2005). Additionally, NVMs may be highly cost-effective, providing 24-hour service with a lack of staffing costs (Islam & Conigrave 2007a; Islam & Conigrave 2007b; Islam, Wodak, Conigrave, 2008b).

Concerns regarding NVM as a delivery model

While the NVM model may increase access to equipment, it is limited in terms of provision of information, counseling, or referrals (Islam & Conigrave 2007b; Islam et al., 2009;

Klein, 2007; McDonald, 2009; WHO, 2004). This concern has been cited as the primary reason for not implementing NVMs in the United States (Islam & Conigrave, 2007a).

The reliability and operability of NVMs are also a concern (Islam et al., 2008a; Lilley et al., 2013; McDonald, 2009). Issues with machines being broken, jammed, or emptied have occurred in settings where NVMs are used (Islam, Stern et al., 2008a; McDonald, 2009). Machines need to be refilled and adequately maintained (Duplessy & Reynaud, 2014). Cost may also be a barrier; however, McDonald (2009) found that 80% of NVM clients considered a \$2.00 AUD cost for a 4-pack of syringes acceptable. Islam and Stern et al. (2008) found that only 16% of users reported payment as a barrier to NVM use.

There is limited evidence to evaluate the impact of NVM on syringe disposal practices. One observational study reported ongoing improper disposal around machines (McDonald, 2009); another study of staff perceptions refuted this problem (Islam et al., 2009).

Effectiveness of NVMs

Evidence shows that NVMs reach clients who are not adequately served by other NSP models (Islam et al., 2007a). Out of 18 studies on NVMs reviewed by Islam et al. (2007a), 16 reported reaching or attracting high-risk and/or hidden populations of people who use drugs. As such, the coexistence of NVMs and other NSP models may increase needle distribution and reduce reuse. Research is needed to examine the impact of NVMs (as an addition to existing NSPs) on injection risk behaviours (Islam, Wodak, Conigrave, 2008).

A cross-sectional study from Australia examined the perceptions of NSP and drug treatment (clinical and support) staff about the effectiveness of NVMs installed at or near their agencies (Islam et al., 2009). Overall, 80% of respondents considered NVMs successful or moderately successful in reducing needle sharing among clients; none rated NVMs as unsuccessful or marginally successful. As well, the majority of participants reported no increase in drug use or vandalism in the community.

Following the installation of four NVMs, McDonald (2009) reported an increase in syringe distribution over a 12-month period. NVMs accounted for 8.7% of all needles distributed. As well, there was a 5.4% increase observed in the total number of syringes distributed, despite small decreases in the proportion of syringes provided by NSPs and pharmacies (2.6% and 8.8%, respectively).

A recent study combined regular NVM monitoring activities and machine counting devices to examine the activity of NVMs in Paris, France, over a 12-year period (1999-2012; Duplessy & Reynaud, 2014). Needle distribution via these machines increased 202% and recovery increased by 2000% over the study timeframe. However, it should be noted that site-specific activity was highly variable; 2 machines out of 34 accounted for 50% of the total activity.

In Québec, the “agence de la santé et des services sociaux de Montréal” conducted an assessment of the feasibility of installing vending machines to distribute injection equipment in Montreal. They held 7 focus groups with 30 people who use drugs and 13 other stakeholders to elicit opinions, ideas, and concerns related to the operation of NVMs in the city. The report identified potential positive and negative impacts for people who use drugs, for the community, and for harm reduction programs in general. It also identified anticipated machine users and necessary conditions for success such as effective advertising and outreach, public and police acceptance, and stakeholder involvement. The report also provided recommendations regarding the machine type (i.e., free dispensing, token system, 1 for 1 exchange, etc.), machine contents, and potential locations. Overall, respondents recommended that the ideal NVM model should be low-threshold, with controlled access (i.e. not accessible to children), and with free or low cost equipment. However, the report presented many concerns and barriers identified by stakeholders and did not indicate whether NVMs are likely to be implemented in Montreal in the immediate future.

Needle/syringe vending machines evidence summary

The evidence that informs this subsection came from predominantly observational studies and reviews. Cross-sectional studies were the main type of study to contribute evidence for this subsection, providing evidence on the characteristics and risk behaviours of people who use NVMs, and perceptions of NVM clients and service providers. Several review papers provided aggregate information on the advantages and disadvantages of NVMs, characteristics of NVM users, and the overall effectiveness of needle/syringe delivery through vending machines. We did not find reports of RCTs or other experimental designs that were applicable for this subsection. Overall, there has been limited research conducted on NVMs.

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2 Needle distribution for anabolic steroid injection, hormone injection, piercing and/or tattooing



RECOMMENDED BEST PRACTICE POLICIES to encourage the use of sterile equipment for injecting anabolic steroids and/or hormones, and for piercing and/or tattooing the skin, and to reduce transmission of human immunodeficiency virus (HIV), hepatitis C (HCV), hepatitis B (HBV), other pathogens, and related harms:

Equipment distribution

- Provide a variety of needle and syringe types suitable for intramuscular injection of anabolic steroids and/or hormones in the quantities requested by clients without requiring clients to return used needles/syringes
- Place no limit on the number of needles/syringes provided per client, per visit (one-for-one exchange is not recommended)
- Provide pre-packaged safer injection kits (needles/syringes, cookers, filters, ascorbic acid when required, sterile water for injection, alcohol swabs, tourniquets, condoms and lubricant) and also individual safer injection supplies concurrently (including sharps containers)
- Assess the need for pre-packaged kits for safer piercing and/or tattooing

Educate new and existing clients

- Educate clients about the proper use of needles/syringes (e.g., one-time use only) and about the risks of using non-sterile needles/syringes for injecting, piercing and/or tattooing
- Educate clients about the risks of sharing multi-dose vials or ampoules of anabolic steroids and the potential risks associated with sharing tattooing supplies (e.g., ink and ink pots)
- Encourage clients to return and/or properly dispose of used needles/syringes

Assess community need and evaluate services

- Assess the prevalence of harms and the need for other education and materials associated with the injection of anabolic steroids and/or hormones and piercing and/or tattooing of the skin
- Determine how best to engage people who inject anabolic steroids and/or hormones, especially transgender people, and people who pierce and/or tattoo the skin, including the use of peer workers, in harm reduction services
- Evaluate and publish any initiatives undertaken

In this chapter, we encourage programs to consider distributing needles of varied gauges for purposes other than intravenous injection of psychoactive substances. We primarily focus on the injection of anabolic steroids (Section I) and the injection of hormones among transgender people (Section II) and related risks associated with each, and also include a short discussion about piercing and tattooing (Section III). For full discussion and evidence regarding the risks of injection drug use and best practices for needle distribution and safer disposal of used injection equipment, please see the Best Practice Recommendations: Part 1, Chapter 1: Needle and syringe distribution and Chapter 9: Disposal and handling of used drug use equipment (Strike et al., 2013).

Section I: Needle distribution for anabolic steroid injection

Description of anabolic steroid use

Anabolic-androgenic steroids (commonly called “anabolic steroids”) are synthetic derivatives of testosterone that promote skeletal muscle growth and the appearance of male sex characteristics; some steroidal supplements also promote higher testosterone levels in the body (Beel et al., 1998; NIDA, 2006). Anabolic steroids can be taken in different ways including intramuscular injection, oral administration, and application to the skin in gel or cream form (NIDA, 2006). People may use anabolic steroids for a variety of reasons, including increasing muscle size, improving appearance, enhancing strength and/or improving sporting performance,

competing in bodybuilding, for medical reasons, and for other occupation-related reasons (Aitken et al., 2002; Beel et al., 1998; Bolding et al., 2002; NIDA, 2006). Anabolic steroids are often taken according to a pattern/schedule or in cycles (“cycling”; Grace et al., 2001; NIDA, 2006). Some people combine use of different steroids or performance-enhancing substances (“stacking”) and/or escalate the number of steroids or dosages up to a peak in a cycle (“pyramiding”; Grace et al., 2001; NIDA, 2006). Anabolic steroids are commonly injected into large muscle groups such as the buttocks, thighs, and shoulders (Aitken et al., 2002; Larance et al., 2008). Needles used for intramuscular injection are typically larger than those used to inject psychoactive drugs, which are commonly injected intravenously. Little is known about the injection of human growth hormone as part of a performance-enhancing regimen (Evans-Brown & McVeigh, 2009) and as such we will not address this substance further.

People who inject anabolic steroids attend harm reduction services like needle and syringe programs (NSPs) in Canada to obtain injection supplies (Mandryk & McDougall, 2013; Sirko, 2014). However, the literature about this topic is sparse, and thus our knowledge is limited about how often people who inject anabolic steroids attend NSPs, the equipment they request, and other issues that are important for providing service to this population. A recent environmental scan of the 36 core NSPs in Ontario revealed that most programs desire more research evidence, local statistics, and guidance regarding how to provide safer steroid use services (Ontario Harm Reduction Distribution Program, 2013).

Evidence of needles and syringes used for anabolic steroid injection as vectors of HIV, HCV, and HBV transmission

Compared to the amount of research about people who inject psychoactive drugs, little is known about the injection risk behaviours and needs of people who inject anabolic steroids. Injection of anabolic steroids can carry risks of transmitting blood-borne infections such as HIV (e.g., see a documented case in Scott & Scott, 1989) and HCV from the use of contaminated needles, syringes, and other injection equipment. Please see Chapter 1 (Strike et al., 2013) for a review of studies pertaining to injection drug use and evidence of HIV, HCV, and HBV in used needles, including evidence about dead-space syringes. Needles of various gauges, including the gauges more suitable for intramuscular injection, are typically ordered as separate or detachable needles which have more dead space than fixed or attached needles/syringes. Although more research is needed, the amount of fluid retained in a needle/syringe has implications for transmission risk if the needle/syringe is reused.

Incidence and prevalence of HIV, HCV, and HBV among people who inject anabolic steroids in Canada

Canadian and international estimates of the incidence and prevalence of HIV, HCV, and HBV are currently lacking for people who inject anabolic steroids.

As described by Hope et al. (2013), in England and Wales, HIV and viral hepatitis among people who inject drugs is monitored through an annual unlinked-anonymous survey. In response to increasing concerns about people who use performance- and image-enhancing drugs (PIEDs) – the most commonly injected are anabolic steroids – a targeted survey was conducted as part of the ongoing survey (Hope et al., 2013). Between May 2010 and May 2011, 395 men who inject PIEDs were recruited through 19 NSPs for oral-fluid samples and a questionnaire. Overall, 12% (n=47) tested positive for one or more of anti-HIV (only 1.5%), anti-HCV, and anti-HBc (a marker for HBV infection); 43 had just one of these markers and four had two or more. Hope et al. (2013) noted that while there are standard methods used for recruiting people who inject drugs, the reliability of these approaches for people who inject PIEDs is unclear given limited knowledge about the size and nature of this population. Only 4.8% of participants in the study had ever injected psychoactive drugs including heroin and cocaine.

Evidence of injection-related risk behaviours associated with anabolic steroid injection

This subsection summarizes the available evidence about risk behaviours associated with injecting anabolic steroids. While there is some evidence of needle/syringe sharing, the sharing of other equipment (particularly vials or ampoules that contain anabolic steroids) and personal needle reuse may deserve special attention from service providers and researchers.

In their review about anabolic steroid use and related issues, Beel et al. (1998) noted that needle sharing among people who inject anabolic steroids is likely underreported, complicating efforts to determine the magnitude of this issue. Nevertheless, older data from US and Canadian studies about high school students who inject anabolic steroids have shown rates of needle sharing varying from 9.1% to 29.1% (Beel et al., 1998). A UK study (Morrison, 1994) that sampled 21 males who injected anabolic steroids reported no needle sharing, though some reported having seen others share needles and syringes. Crampin et al. (1998) examined data from the national (England and Wales) Unlinked Anonymous HIV Prevalence Monitoring Survey of people

who inject drugs. In 1991, none of the 719 participants who currently injected drugs were injecting anabolic steroids. By the end of the study period in 1996, 149 participants had injected anabolic steroids. It is not clear from the article if all of those who reported injecting steroids had ever injected, or were also injecting, other drugs. Saliva specimens were also tested; none of the people who injected anabolic steroids had antibodies to HIV while three had antibodies to HBV (prevalence of 2%). None of the latter three had reported sharing of injection equipment. Eight out of 134 current steroid users reported “ever having received” used needles or syringes, though it is not clear from the study if these people actually used those needles or syringes. Crampin et al. (1998) suggested that people who inject anabolic steroids be distinguished from other people who inject drugs because they are a different group in terms of their injecting practices and other characteristics.

A case-control study of HIV and HCV risk behaviours among anabolic steroid users from the North East of England found low rates of injection-related risk behaviours among a sample of male weight trainers (Midgley et al., 2000). The study had 90 participants who were given a semi-structured interview and questionnaire; 50 used anabolic steroids and 40 were controls. Of those who used steroids, 47 were currently injecting steroids, two had used oral steroids only but had injected at some point in the past, and one never injected. The mean number of anabolic steroid injections per week was 2.93 (range 0-18) and 15% were injecting steroids at least once per day. The most commonly reported injection-related risk behaviours among the sample were sharing of multi-dose vials (23.4%) and dividing substances using syringes (17%). One person reported sharing injecting equipment (his training partner used a needle and syringe after he had used) and two reported seeing other people who use anabolic steroids share injecting equipment in the past. This study also examined sexual risk behaviours and found that people who use anabolic steroids engaged in more risky sex practices compared to controls.

In another UK study, Grace et al. (2001) recruited 106 gym users from three non-commercial gyms that carry a wide array of heavy weight training equipment in South Wales. Fifty-three percent (all males) reported using anabolic steroids in the last year. Among this group, 69% combined oral and injection steroid administration, while 20% reported injection only and 11% oral administration only. Twenty percent of participants who had injected anabolic steroids reported having shared syringes with others at times when syringes were unavailable. In a cross-sectional study that recruited

772 gay and bisexual men from six gyms in central London, UK, Bolding et al. (2002) found that 15.2% (n=117) had used anabolic steroids and 11.7% (n=90) had injected steroids in the last 12 months. Among 85 who injected anabolic steroids and provided information about their injecting behaviour, 94.1% reported always using clean, disposable needles, and 8.2% reported having sometimes reused their own needle on themselves. None reported sharing needles or syringes, but two (2.4%) people had split a multi-dose container with at least one other person. Bolding et al. (2002) also reported that the prevalence of anabolic steroid use was significantly higher among gay or bisexual, HIV-positive men (31.7%) compared to those who were HIV-negative (14.5%) or never tested (4.7%); this same pattern held for those who inject anabolic steroids (24.6%, 10.9%, and 4.1%, respectively).

In a seroprevalence study from Victoria, Australia, that used a convenience sample of people who inject illicit anabolic steroids, Aitken et al. (2002) reported that HCV was much lower among the steroid users compared to what was typically found among people who inject other drugs. Out of 63 blood samples tested, six (9.5%) had HCV antibodies, while out of 50 specimens tested for HBV, six (12.0%) tested positive for the HBV core antibody; none contained HIV antibodies. Among the 58 participants who completed a questionnaire, only half had injected anabolic steroids in the month prior to the interview. The mean number of steroid injections in the last month was 10 (range 2-50). None reported injecting steroids with a needle that had been previously used by someone else, but four (6.9%) had shared a needle to inject other drugs and only one had given his needle to someone else in the 12 months prior to the interview. Comparison of injecting behaviours between those who tested positive for the HCV antibody versus those who had not showed no difference in steroid-injecting behaviours. In an earlier analysis of Australian data, among 127 clients of a Steroid Peer Education Project – a program that provided people who inject steroids with specialised needle distribution and collection services – 6% had used someone else’s used needle to inject steroids or other drugs, 14% reused their own needle, and 15% had injected steroids or drugs from a shared container (Delalande et al., 1998).

Larance et al. (2008) collected data in the Sydney, Australia, region between January and August 2005 from 60 males who used anabolic steroids, human growth hormone, or insulin-like growth factors for non-medical reasons in the previous six months. Ninety-three percent of participants had intramuscularly injected PIEDs at some point in their lifetime and 68% reported injecting in the last month. Only 5%

reported ever sharing needles; one had shared needles in the past month to inject other illicit drugs. Personal needle reuse was more common (13%). Seventy-seven percent reported illicit drug use in the last six months (most commonly stimulants and cannabis) and 27% reported ever having injected illicit drugs.

Overall, people who inject anabolic steroids seem to exhibit low rates of needle/syringe sharing. However, a potentially unique transmission risk among this population is that they may be likely to share vials or ampoules that contain anabolic steroids. In the study noted earlier by Hope et al. (2013), 8.9% of participants reported having ever shared a needle/syringe or drug vial – 6.8% (n=27) had shared only a vial, while 1.5% (n=6) shared a needle/syringe and 0.51% (n=2) shared both. Larance et al. (2008) found that 29% of their sample had injected from a shared vial or container. When discussing injection-related risks with people who inject steroids, harm reduction program staff should highlight that sharing any piece of injection equipment carries the risk of pathogen transmission.

Injecting anabolic steroids can lead to bruising and damage around injecting sites, particularly if a needle is reused. Wounds are vulnerable to bacterial infection, and the risk of abscesses is also a concern when needles are reused. Some evidence shows that people who inject anabolic steroids may reuse their own needles, causing the needle tip to become duller each time. Aitken et al. (2002) noted that because some force is needed to inject into parts of the body like the buttocks and shoulders, and because these can be awkward or imprecise spots to reach, such injecting can lead to puncture wounds that bleed. Pain around injecting sites may also occur (Bolding et al., 2002). Larance et al. (2008) noted that the combination of a thicker needle and greater force may damage skin and surrounding tissue.

Policies for distributing needles for anabolic steroid injection

Studies document that people who inject anabolic steroids access NSPs (Beel et al., 1998; Crampin et al., 1998; Dunn et al., 2014; Hope et al., 2013; Iversen et al., 2013; Kimergård & McVeigh, 2014; Larance et al., 2008; Morrison, 1994), but there is little evidence about the frequency of attendance. Cross-sectional survey data from Australian NSPs have supported anecdotal reports that this is an increasing population of NSP attendees in New South Wales and Queensland (Iversen et al., 2013). There are also indications that people who inject anabolic steroids are a hard-to-reach group for harm reduction programs (Aitken & Delalande, 2002; Larance et al., 2008). In a qualitative interview study of 24 peo-

ple who use anabolic steroids and nine service providers from England and Wales, Kimergård and McVeigh (2014) reported that people who inject anabolic steroids perceived themselves as different from other people who inject drugs. The authors stated that people who inject anabolic steroids “tended to ignore or at least make their risky behaviours seem less hazardous than they actually were” (p. 5), even though some participants reported risk behaviours such as needle reuse. This distancing from other types of people who use drugs, and the stigma associated with injection drug use, may impede NSP attendance or service uptake among people who inject anabolic steroids.

As noted earlier, people who inject anabolic steroids may share injection equipment when sufficient equipment is not available (Grace et al., 2001), though rates of needle sharing seem to be lower in comparison to people who intravenously inject psychoactive drugs. In the study by Midgley et al. (2000), some participants explained in interviews that injection risk behaviours were not as common among people who use anabolic steroids because sterile injecting equipment is readily accessible to them. The majority of participants in that study who injected anabolic steroids obtained their needles from NSPs. Larance et al. (2008) also found that a majority (71%) of their participants reported obtaining needles from NSPs (versus 14% from a chemist/pharmacy, 11% from a doctor, 2% from friends, and 2% from others). Although many obtained injecting equipment from NSPs, only 7% reported seeking information about PIEDs from NSP services (Larance et al., 2008). More often, participants relied on the Internet, friends, doctors, and gym contacts for information.

NSP provision of needles suitable for anabolic steroid injection without limits on the number distributed (i.e., so that clients always have a new needle for each injection) may promote NSP access for people who inject anabolic steroids and thus help to prevent blood-borne pathogen transmission among those at risk. There is little empirical data concerning the best types of needles for anabolic steroid injection; however, the UK manufacturer Exchange Supplies (www.exchangesupplies.org) recommends varying gauges between 21 and 30. Some community-based sources recommend 18 to 25 gauge needles, between 1 and 1.5 inches in length, for drawing up and injecting anabolic steroids. It is important that different needles are used for drawing up and injecting anabolic steroids as, again, any reuse dulls the needle tip; the needle tip should always be new and sharp for actual injection. Needles of 22 to 23 gauge are typically used for injecting in the buttocks (Sirko, 2014).

In addition to needles/syringes, harm reduction programs may want to consider distributing other pieces of equipment to people who inject anabolic steroids, including small-volume vials of sterile water. Although there is no specific literature about this issue, it has been suggested by service providers that since some people obtain steroids in a powder form that needs to be mixed with water, distributing sterile water to these clients may help prevent any sharing of mixing-water sources. Alcohol swabs should be distributed for cleaning the injection site and clients should also have access to biohazard containers for safer sharps disposal (Sirko, 2014).

To reach clients who inject anabolic steroids, outreach may need to be conducted in locations these clients are likely to frequent, such as gyms and sports centres, and include appropriate and knowledgeable peers, such as bodybuilders or trainers, to make contact (Aitken & Delalande, 2002). These specific types of peers may already have a relationship with and are more likely to be trusted by people who inject anabolic steroids who may not attend NSPs. In the study by Kimergård and McVeigh (2014), all participants who use anabolic steroids reported that they had easy access to needles and syringes from harm reduction services, but outreach distribution to gyms and secondary distribution (i.e., distribution between people who inject anabolic steroids) were also accepted practices. Although these practices may extend the reach of harm reduction services, service providers may be concerned about missing opportunities to engage with vulnerable groups such as young people who start using anabolic steroids (Kimergård & McVeigh, 2014). Specialized services such as steroid clinics can offer additional opportunities to distribute sterile injecting equipment alongside conventional NSPs. People who use anabolic steroids may find specialized clinics attractive, especially if they are staffed by non-judgemental workers who are highly knowledgeable about anabolic steroids (Kimergård & McVeigh, 2014).

Because some people purchase anabolic steroids and related substances – as well as obtain information (e.g., in bodybuilding forums) – online, there may be opportunity to develop online peer outreach or interventions. Larance et al. (2008) suggested that people who inject PIEDs need information on blood-borne and other infections, hepatitis vaccinations, injection techniques, hygiene procedures (e.g., hand washing), and the range of negative physical effects linked to PIED use. These authors also suggested that harm reduction advice should include consideration of factors such as dose, frequency of use, diet and training, other illicit drug use, safer sex, and monitoring of mental and physical health. Given

the available evidence on risk behaviours, people who inject anabolic steroids appear to need targeted injection-related education concerning the risks of reusing one's own needle and the risks of blood-borne virus transmission when any pieces of injection equipment are shared (including use of multi-dose vials or ampoules containing steroids or other substances). Many harm reduction program staff may also need specific training and education about anabolic steroid use and related issues before and when working with clients who inject steroids. Dunn et al. (2014) interviewed 13 NSP workers from New South Wales, Victoria, and Queensland, Australia about their contact with people who use anabolic steroids. Workers expressed concern about their own level of knowledge regarding anabolic steroids and the equipment that clients need, in addition to concern about lack of knowledge among clients. Dunn et al. (2014) suggested that there is a need for workforce training and better engagement of people who use anabolic steroids in harm reduction strategies. Kimergård and McVeigh (2014) learned in their study that service providers can have conflicting views about the “boundaries of harm reduction” for people who inject anabolic steroids. While service providers in their sample agreed that needle and syringe distribution is essential, they disagreed on how much information workers should give to clients about anabolic steroids and their use, in part due to the unknown effects of taking high doses of anabolic steroids over a long period of time.

Other health-related harms associated with anabolic steroids

Use of anabolic steroids has been associated with several serious health-related side effects including increased risk of coronary heart disease, blood clots, and liver damage (Beel et al., 1998; Morrison, 1994; NIDA, 2006). As such, regular medical check-ups are important for this population. However, much of what we know about long-term effects from steroid use comes from case reports rather than large, epidemiological studies (NIDA, 2006). Steroid use can produce reversible and irreversible effects due to changes in hormone production, including reduced sperm production and testicular atrophy in men (NIDA, 2006). Psychological effects associated with steroid use include aggression and symptoms of dependence and withdrawal after stopping use (Beel et al., 1998; NIDA, 2006). In the study by Bolding et al. (2002), those who used anabolic steroids were more likely than non-users to report having suicidal thoughts or to have felt depressed.

In addition, people who use anabolic steroids may acquire black-market steroids and other substances that are

thought to be steroids from online or street-based sources (Aitken et al., 2002) and injection of these substances may carry (unknown) risks of other side effects and harms. As there is no assured quality control when purchasing anabolic steroids from online and street sources, people who do so should be reminded to make sure the packaging has not been opened, look at labels and expiry dates, and check for any floating debris in liquid in vials (Mandryk & McDougall, 2013; Sirko, 2014).

Further resource regarding anabolic steroids

Ottawa Public Health resource on Anabolic Steroids; 2013. <http://librarypdf.catie.ca/pdf/ATI-20000s/26426.pdf>

Section II: Needle distribution for hormone injection

Description of hormone use among transgender people

The term “transgender” refers to a highly diverse group of people “who cross or transcend culturally defined categories of gender” (Bockting et al., 1998). Transgender and gender-diverse people typically identify with a gender(s) that differs from the gender they were assigned at birth. There are many different terms and identities included under the transgender umbrella, including but not limited to trans men, trans women, male-to-female, female-to-male, transsexual, genderqueer, gender-neutral, and Two-spirit. Transgender people can present in a variety of ways. They may or may not choose to undergo hormone therapy or gender-affirming surgeries, or may choose only some of the medical options or interventions available in the transition process.

To modify external appearance, hormones are taken (orally, injected, or transdermally) by some transgender people to suppress undesired secondary sex characteristics and/or to induce and maintain the desired secondary sex characteristics (De Santis, 2009; Khobzi Rotondi et al., 2013). Hormones for “feminizing” the body include estrogen and progesterone, while testosterone is a “masculinizing” hormone. Anti-androgen drugs may also be taken to block the effects of testosterone. According to the World Health Organization (2011), “Hormone injection is the most common gender enhancement practice among transgender people” (p. 55). Hormonal interventions should be medically supervised, although some transgender people obtain hormones from non-medical sources (WHO, 2011). People who inject hormones typically administer the injections intramuscularly (e.g., into the thighs and buttocks). Some may believe that injection produces better effects compared to oral administration (Bockting et al., 1998; Edwards et al., 2007). However, decisions to inject hormones may also be based on costs (i.e., testosterone preparations that can be injected are usually less expensive) and availability. Other substances such as silicone may also be injected as gender enhancements (i.e., for added curves to the body; Bockting et al., 1998; De Santis, 2009); such practices may be relatively uncommon at this time in Canada, but are important to note as they may carry additional risks (e.g., inflammation, infection).

Evidence of needles and syringes used for hormone injection as vectors of HIV, HCV, and HBV transmission

Injection of hormones with previously used needles and syringes can put people at risk of transmitting or acquiring HIV, HCV, HBV, or other pathogens. Although limited,

there is evidence to substantiate this injection-related risk among transgender people. The WHO (2011) recommends that, “Transgender people who inject substances for gender enhancement should use sterile injecting equipment and practise safe injecting behaviours to reduce the risk of infection with bloodborne pathogens such as HIV, hepatitis B and hepatitis C” (p. 14). Further, the WHO (2011) notes that although “conclusive evidence” is missing regarding an association between hormone injection and HIV transmission, there is potential for needle sharing in the context of “frequent self-administration of these substances” (p. 56). Please see Chapter 1 (Strike et al., 2013) for a review of studies pertaining to injection drug use and evidence of HIV, HCV, and HBV in used needles, including evidence about dead-space syringes. Needles of various gauges, including the gauges more suitable for intramuscular injection, are typically ordered as separate or detachable needles which have more dead space than fixed or attached needles/syringes. Although more research is needed, the amount of fluid retained in a needle/syringe has implications for transmission risk if the needle/syringe is reused.

Incidence and prevalence of HIV, HCV, and HBV among transgender and people who inject hormones

Canadian estimates of the incidence and prevalence of HIV, HCV, and HBV are lacking for transgender people (Anderson, 2014). Chen et al. (2011) noted that transgender status has not been collected in US national HIV/AIDS surveillance activities and, when data on transgender status have been collected, the accuracy of such data depends on how someone presents to their medical provider. Nonetheless, studies have shown that transgender people are among those at high risk for HIV through sexual behaviours, rather than non-sexual or injection-related behaviours (e.g., Baral et al., 2013; Bauer et al., 2012; Clements-Nolle et al., 2001; Edwards et al., 2007; Nemoto et al., 1999; WHO, 2011). For example, Baral et al. (2013) performed a meta-analysis comparing HIV infection in trans women populations to adults of reproductive age in 15 countries. Pooled HIV prevalence in 11,066 trans women worldwide was 19.1%. The odds ratio for HIV infection in trans women compared with other adults was almost 49 and did not differ for those in low- and middle-income countries compared to those in high-income nations. According to the WHO (2011), “The few existing epidemiological studies among transgender people have shown disproportionately high HIV prevalence ranging from 8% to 68%, and HIV incidence from 3.4 to 7.8 per 100 person-years” (p. 10). Currently, the relative contribution of hormone injection versus injection drug use versus sexual

risk behaviours to the incidence of HIV among transgender people is not known and further research is needed.

Evidence of injection-related risk behaviours associated with hormone injection

Evidence is limited from Canadian contexts regarding hormone injection and related risks among transgender people. Using survey data from the Trans PULSE Project, a large Ontario study of transgender people conducted from 2009 to 2010, Bauer et al. (2011) reported that 36.4% of trans men and 6.0% of trans women injected hormones, 0.8% of the sample injected drugs in the past year, and three participants ever injected silicone. Two reported reuse of another person’s needle. Also using Trans PULSE data, Khobzi Roton-di et al. (2013) examined “do-it-yourself” (DIY) hormone use. Among the 402 of 433 participants who provided information pertaining to hormones, 43% reported hormone use. Among these, four reported DIY hormone injection and three reported obtaining needles or syringes from NSPs or from doctors’ offices. Anecdotally, Canadian transgender people sometimes share vials containing hormones (e.g., vials of testosterone); once a contaminated needle is introduced into a shared vial, this presents a risk of blood-borne pathogen transmission (Young, personal communication, 2013).

Bockting et al. (1998; 1999) developed an HIV prevention education program for transgender people in Minneapolis and St. Paul, Minnesota. The first phase of this project involved gathering data from 19 transgender individuals who participated in focus groups. Sharing needles used to inject hormones was one of the risk factors discussed by participants. Both trans women and trans men may acquire hormones through street or underground sources and administer them without medical supervision. Bockting et al. (1998) noted that people acquiring hormones and silicone from underground sources sometimes do not consider themselves as people who use drugs and as such may not perceive needle-sharing behaviour as risky.

Garofalo et al. (2006) surveyed a convenience sample of 51 ethnic-minority trans women youth (aged 16 to 25) in Chicago. While 61% reported using “feminizing hormones” like estrogen – and 44% reported injection hormones – only 29% received hormones from a medical provider. Only 8% (n=4) of the sample reported shared needle use for injection of hormones or silicone. Injection of illicit drugs (e.g., heroin) was uncommon among this sample, though 29% reported lifetime use of injecting silicone.

Edwards et al. (2007) examined data from an annual risk assessment survey conducted in 2004 by the Los Angeles County Department of Health Services, Office of AIDS Programs and Policy. Out of 2,126 survey completers, 96 (4.5%) identified as male-to-female transgender and 11 (0.5%) as male-to-female transsexual. Factors associated with identifying as transgender included, among other factors: using a needle to inject steroids or hormones in the last six months, using a needle after someone else in the last six months, having ever been paid for sex, being marginally housed, and having ever received HIV testing or counselling. However, heroin use in the last six months was inversely related to identifying as transgender. When compared to non-transgender participants, those who identified as transgender were significantly more likely to have injected with a used needle compared to other clients; however, they used hormones more often and were not more likely to inject illicit drugs than other clients. Among transgender participants, 52% reported that they were HIV-positive compared to 22% of the non-transgender participants. Edwards et al. (2007) noted that the study questionnaire allowed differentiation between hormone injections and other substances, and that research should continue to include this distinction.

Compared to trans women, much less is known about trans men and their risk behaviours; thus more research is needed (De Santis, 2009). Chen et al. (2011) studied data from 59 trans men in San Francisco to describe their HIV risk factors. Among this population, sexual risk behaviours may be of greater concern than non-sexual risk behaviours (e.g., 63% of this sample reported unprotected receptive vaginal or anal sex in the past year). Eight percent of the trans men reported injection drug use in the past 12 months and 5% shared needles in the same time period. The study did not report on hormone use.

Policies for distributing needles for hormone injection

NSP distribution of a variety of needles and syringes appropriate for hormone injection alongside other harm reduction equipment and materials on safer sex and safer drug use education will promote accessibility of programs for transgender people. In their study of DIY hormone use, Khobzi Rotondi et al. (2013) noted the need for NSPs and doctors “to be flexible in providing gauges of needles that are suitable for intramuscular injections” (p. 1835). As well, there is a pressing need for trans-positive or trans-inclusive HIV prevention educational materials and inclusive or friendly attitudes among medical professionals and other service providers (see Garofalo et al., 2006; Lyons et al., 2015;

Namaste, 1999; Underwood, 2008). Cost and lack of needle availability can place transgender people at risk for HIV and other infections through sharing and reuse of needles for hormone injection (Namaste, 1999). We know from studies of NSPs that policies that limit the number of needles distributed also limit the effectiveness of strategies to prevent HIV and HCV transmission (please see again studies reviewed in Chapter 1, Strike et al., 2013). Providing access to needles suitable for hormone injection without placing limits on the number distributed (i.e., so that clients always have a new sterile needle for each injection) may help prevent HIV and HCV transmission, and other injection-related harms, among transgender people who inject hormones. There is a lack of evidence on the types of needles that are best for injecting hormones, but community-based sources recommend that needles of different gauge sizes be used for drawing up hormones and for injecting hormones due to the viscous nature of most hormones. A wider gauge needle of 18 can be used for drawing up hormones, while gauge sizes of 22 to 23 can be used for intramuscular injection. Needle length is also a consideration; depending on body build some people may need, for example, needles that are 1 to 1.5 inches in length in order to reach muscle.

Studies report high levels of social isolation and stigma experienced by transgender people, which can be accompanied by psychological distress, including struggling with gender identity (e.g., De Santis, 2009; Garofalo et al., 2006; Lyons et al., 2015; Underwood, 2008). Evidence suggests that multiple life stressors among transgender people may increase the risk of substance use, including injection drug use (De Santis, 2009). However, the prevalence of psychoactive drug injection, as noted above, appears low. Research has found that transgender people are also likely to engage in sexual risk behaviours, including engaging in sex work (Bauer et al., 2012; De Santis 2009). Some transgender people may reach out to harm reduction programs on the basis of these risk behaviours and needs. Programs may better attract and serve the needs of diverse transgender clients by offering tailored educational materials on safer sex and safer drug use alongside needles appropriate for hormone injection.

Further resources and program listings regarding transgender people and health

Brazen: Trans Women’s Safer Sex Guide; 2013. http://orders.catie.ca/product_info.php?products_id=26023

Canadian Professional Association for Transgender Health (CPATH) website: www.cpath.ca/

Grant JM, Mottet LA, Tanis J, Harrison J, Herman JL, Keisling M. Injustice at Every Turn: A Report of the National Transgender Discrimination Survey. National Center for Transgender Equality and National Gay and Lesbian Task Force; 2011. www.thetaskforce.org/downloads/reports/reports/ntds_full.pdf

Primed: The Back Pocket Guide for Transmen & the Men who Dig Them; 2010. http://orders.catie.ca/product_info.php?products_id=25619

Sherbourne Health Centre. Guidelines and Protocols for Hormone Therapy and Primary Health Care for Trans Clients; 2015. <http://sherbourne.on.ca/wp-content/uploads/2014/02/Guidelines-and-Protocols-for-Comprehensive-Primary-Care-for-Trans-Clients-2015.pdf>

Trans PULSE Resource Guide; 2011. <http://transpulseproject.ca/resources/resource-guide/>

Section III: Needle distribution for piercing and tattooing

As with other types of needles, those used for piercing and tattooing can be vectors of HIV, HCV, HBV, and other pathogens when they are reused or shared (e.g., Armstrong et al., 2007; D'Souza & Foster, 2003; Holbrook et al., 2012; Jafari et al., 2010). Evidence demonstrates HIV HCV, and HBV risks among people who receive piercings and tattoos in prison (e.g., Crofts et al., 1996; Dolan et al., 1999; Hellard & Aitken, 2004; Hunt & Saab, 2009; Kinner et al., 2012; Samuel et al., 2001; WHO, 2007). The exact magnitude of transmission risk among people who pierce and tattoo is unclear, as is the number of harm reduction programs across Canada that provide services and equipment to this population. The prevalence and characteristics of people who pierce and tattoo in informal settings is also unknown. Nevertheless, some local harm reduction programs come into contact with clients who desire services and have developed kits specifically for piercing. These contain supplies such as 18.5 gauge needles, gloves, swabs, gauze, piercing aftercare solution, and containers for safer disposal.

Within the context of clients accessing community-based harm reduction programs, there is a lack of studies that focus on behaviours related to and programs that encourage safer piercing and tattooing. However, we recommend that programs follow universal precautions (also known as "routine practices;" e.g., see Canadian Centre for Occupational Health and Safety website for further information at www.ccohs.ca/oshanswers/prevention/universa.html) by recommending that clients always, for example, clean the injection site, never reuse injection equipment, and never share needles or injection equipment. Further, tattoo ink and ink pots should not be reused or shared as ink can also become contaminated with bacteria and other pathogens, including those that can lead to skin infections (Centers for Disease Control and Prevention, 2012; LeBlanc et al., 2012). We encourage programs that provide safer piercing and/or tattooing services to more formally document, evaluate, and publish their policies and services. For programs looking for more guidance, we direct readers to some public health recommendations used across the country for piercing and tattooing establishments.

Further resources regarding safer piercing and tattooing

Alberta Health Standards and Guidelines for Body and Ear Piercing; 2002. www.health.alberta.ca/documents/Standards-Body-Ear-Piercing.pdf

Alberta Health Standards and Guidelines for Tattooing; 2002. www.health.alberta.ca/documents/Standards-Tattooing.pdf

Manitoba Health Personal Service Facility Guidelines; 2013. www.gov.mb.ca/health/publichealth/environmentalhealth/protection/docs/psf_guideline.pdf

Toronto Public Health link about piercing: www1.toronto.ca/wps/portal/contentonly?vgnextoid=c9c9e29090512410V-gnVCM10000071d60f89RCRD&vgnextfmt=default

Needle distribution for anabolic steroid injection, hormone injection, piercing and/or tattooing evidence summary

The evidence that informs the three main sections in this chapter and the overall recommendations came from a fairly limited number of studies. Cross-sectional studies and a mix of other study designs have contributed information about risk behaviours among people who inject anabolic steroids. Cross-sectional studies and a few qualitative studies have contributed information about risk behaviours among transgender people.

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3

Foil distribution



RECOMMENDED ACTIVITIES to evaluate the need to distribute foil sheets for safer smoking of heroin and other drugs:

- Assess the prevalence of heroin smoking and related smoking harms in the community
- Determine how best to engage people who smoke heroin in harm reduction services
- Assess the level of support among people who use drugs for distribution of foil sheets for safer smoking
- Assess education and other equipment needs within this population
- Obtain a legal opinion regarding distribution of foil sheets for safer smoking
- Evaluate and publish any initiatives undertaken

Rationale for distributing foil sheets

At the time of writing, Canadian harm reduction programs were not distributing foil sheets for safer smoking of heroin or other drugs. This brief chapter outlines the available yet limited evidence to help programs to decide if foil sheet distribution to clients can reduce harms in their community. Unlike the drug use equipment recommended in the Best Practice Recommendations: Part 1 (Strike et al., 2013), to date foil is not considered to be a direct prevention intervention for HIV, hepatitis C (HCV), hepatitis B (HBV), and other blood-borne infections. As described in more detail below, foil distribution has been suggested as a route or reverse transition intervention (RTI). Stillwell et al. (2005) defined RTIs as “a temporary or permanent transition in the way that a drug is ingested. RTIs developed thus far have aimed to either prevent injecting drug use or divert people away from injecting” (p. 4). Despite intuitive appeal, there is a lack of evidence concerning the effectiveness of RTIs, and smoking drugs carries other risks, as further discussed below.

While smoking various drugs on store-bought aluminum foil is possible, there is concern that it may be coated with cooking or vegetable oils. Although there is no evidence to suggest that such coating on store-bought aluminum foil is a health risk, people who smoke heroin may desire foil without coating (Pizzey & Hunt, 2008). Specially designed foil sheet packs are available from Exchange Supplies (www.exchangesupplies.org). This United Kingdom-based manufacturer offers shrink-wrapped packs (20 sheets or 50 sheets) of 100% aluminum foil; sheets measure 200 mm x 125 mm. Also, Exchange Supplies has produced a step-by-step graphic publication, *Smoking Brown*, that shows how to prepare foil (i.e., how to make “tooter tubes” and “chase

foil”) and a video that demonstrates how to make foil pipes (www.youtube.com/watch?v=qRhrtCcbowE).

Description of how heroin and other drugs are smoked using foil sheets

Aluminum foil is used to smoke some drugs that are in a form that produce inhalable vapours when heated, including brown heroin, crack cocaine, methamphetamine, other illicit drugs, and pharmaceuticals such as Oxycodone. Drugs in tablet form, such as prescription opiates, can be crushed so that the resulting powder is placed on the foil and heated from underneath while a tube or cylindrical instrument (e.g., a straw) is used to direct and inhale the vapours. The tube or “pipe” can also be fashioned out of pieces of foil. Smoking heroin in this way is commonly referred to as “chasing the dragon,” a practice that originated in Hong Kong during the 1950s (though earlier forms of heroin smoking were reported in Asia in the 1920s; Strang et al., 1997). After its emergence, the practice of “chasing the dragon” subsequently spread to other parts of Southeast Asia, the Indian subcontinent, and parts of Europe, notably the Netherlands, the UK, and Spain, with little appearance in the United States (Strang et al., 1997). In the Netherlands, epidemiologic studies have shown that this is the main way people administer heroin (Hartgers et al., 1991; van Ameijden & Coutinho, 2001).

Drug-use patterns change across time and place, depending on different factors including the drugs available and attitudes towards certain drugs and related risks. Strang et al. (1997) noted that “chasing” became more popular in different parts of the world when heroin became more available

in its base form. Heroin in its base form is suitable for heating since “it melts without decomposition” (Strang et al., 1997, p. 679) at a lower temperature than its hydrochloride form which is more water soluble and thus more suitable for injection. Some people choose not to inject heroin or prefer smoking heroin because they do not like needles and/or are concerned about heroin injection-related risks of addiction, overdose, infection, and damage to skin and veins (Stillwell et al., 2005). People who use drugs also have concerns specific to smoking heroin such as concern about achieving a less intense high from smoking, harmfulness (e.g., harms to the lungs), and other unpleasant experiences (e.g., nausea, dislike the smell of smoked heroin; Pizzey & Hunt, 2008; Stillwell et al., 2005). However, absorption of heroin through the lungs is rapid and bioavailability estimates suggest that heroin administration via this method is quite efficient (Klous et al., 2006; Rook et al., 2006a, 2006b).

Evidence of risks from smoking heroin

Lung and breathing problems are some of the risks associated with smoking drugs, although there are gaps in our knowledge regarding the risks of smoking heroin. According to Pizzey and Hunt (2008):

Heroin smoking is not without its own harms. Dependence certainly occurs and (long term) heroin smoking is associated with respiratory health problems, although research has not yet adequately quantified these risks or distinguished them from confounding factors that are common among heroin users such as tobacco and cannabis smoking. Although the risk of overdose is lessened when heroin is inhaled, it is not eliminated.

Boto de los Bueis et al. (2002) analysed self-reported behavioural and lung function data from people (n=62) recruited from a drug rehabilitation centre who inhaled heroin mixed with cocaine on foil. Among this sample, 41.9% reported wheezing over the last 12 months, 44.4% reported bronchial hyperreactivity (BHR), and 22% reported asthma. These rates of BHR and asthma were significantly higher than those found in a control group of 122 people randomly chosen from the general population who did not inhale heroin-cocaine mixtures. In a prospective epidemiological study, Mientjes et al. (1996) reported that smoking heroin was a risk factor for pneumonia among a sample of HIV-negative people who use drugs, but it did not seem to be a risk factor among those who were HIV-positive.

In terms of other health-related harms, leukoencephalopathy is a disease that involves the white matter of the brain

and can have effects on motor, sensory, visual, cognitive, and emotional function. While an association between toxic leukoencephalopathy and smoking heroin has been long recognised, more research on etiology is needed (Buxton et al., 2011). In 27 cases of heroin-associated leukoencephalopathy identified in Victoria and Vancouver, with onset between 2001 and 2006, 13 died (Buxton et al., 2011). The authors obtained drug history information for 18 (67%) of the cases; other illicit drug use (e.g., cocaine, marijuana) was reported and in three of the Victoria cases smoking heroin was the only form of illicit drug use reported. In addition, in a letter to the editors, Nyffeler et al. (2003) described a case study suggesting that chronic progressive myelopathy is a neurological abnormality associated with “chasing the dragon.”

Evidence of risks from smoking with foil

There is little research that documents the potential health risks associated with using aluminium foil to smoke drugs such as heroin. However, aluminum is a neurotoxin (Exley et al., 1996) and could be volatilised and inhaled if used for “chasing the dragon” (Exley et al., 2007), and thus may lead to an accumulation of aluminum in the body. Exley et al. (2007) studied samples of urine from current heroin users and past heroin users (i.e., had not used heroin for at least three months) and compared these to samples from non-drug using individuals. Urinary aluminum values were wide-ranging, though the values for current and past heroin users were significantly higher ($p < 0.001$) than the control group. In their lab-based study, Brenneisen and Hasler (2002) heated samples of street heroin on foils at 250 to 400° Celsius and analysed the vapours. Seventy-two thermal decomposition products of the street heroin, residues from the foils, other by-products, and adulterants were detected, but only about half of these products could be identified. Again, further research is needed to identify the by-products of smoking in order to determine the specific health risks associated with using foil to smoke drugs.

Although there is no available literature about people sharing the tubes or pipes they may fashion out of foil to direct the vapours when “chasing,” in theory these items can be shared like other types of pipes. If such sharing occurs, it might present risk of pathogen transmission. (For a full discussion of the risks associated with sharing smoking equipment, please see the Best Practice Recommendations: Part 1, Chapter 8: Safer crack cocaine smoking equipment distribution.) Service providers should consider raising this issue with their clients who may be or are smoking drugs

using foil and advise that each person should use only their own smoking equipment.

We know from service providers that some clients use aluminum foil in different ways to smoke drugs (e.g., fashion a filter out of foil for homemade pipes/bongs; Augustine, personal communication, 2013). Although we could not find literature specific to this issue, there is a concern about health-related harms that might result if such devices cause burns or break. (Again, readers may want to refer to the Best Practice Recommendations: Part 1 chapter 8 for more information about smoking drugs with makeshift materials.)

Foil sheet distribution

There is a need for outcome evaluations on harm reduction program foil distribution. In one of two published evaluations we found, Pizzey and Hunt (2008) examined a foil distribution initiative that involved four needle and syringe programs (NSPs) in South West England. Programs were offering 50-sheet foil packs. During their study, conducted between 2006 and 2007, 320 people who use opiates attended the NSPs and made a total of 1,672 visits; 174 (54%) of those who attended across the sites chose to take foil packs. However, this figure may underestimate potential demand for foil because clients presenting with other “clinical priorities” were not offered the foil. Also, staff targeted femoral injectors and people who said that they had injecting-related problems. The first time a client received foil, he or she was asked to complete a questionnaire at the time and follow-up data were collected upon a client’s return to the NSP. The following data were obtained from 48 clients who had all previously smoked heroin (some had also injected heroin): All except two clients ($n=46$) used the foil sheets and 85% ($n=41$) had “chased” on one or more occasions when they might otherwise have injected. Frequency of foil use varied considerably and was often intermittent, but among those who used the foil, most reported that having it led to at least some replacement of injecting with smoking. All 48 in the follow-up sample agreed that having foil available is a helpful adjunct to NSP services.

Pizzey and Hunt (2008) also reported that some people might not have accessed foil outside of the NSPs due to lack of money, inconvenience, and/or embarrassment about purchasing foil from shops. Among clients who initially did not want to try the foil were those who tried it at a later time, such as when they began treatment or wanted to avoid injecting. Some clients gave foil to other people who inject

drugs and to people who “chase.” During the study, 32 new clients attended the NSPs to obtain foil. This finding suggests that by offering foil sheets, programs might be able to attract new clients, including non-injecting heroin users, and engage them in health and social services. Finally, Pizzey and Hunt (2008) found that most comments about the foil packs were positive, including appreciation of the thickness and size of the sheets.

In a more recent preliminary evaluation, Stöver and Schäffer (2014) examined the ‘SMOKE-IT!’ project, an intervention and survey implemented at several German drug consumption rooms (DCRs). People who use heroin were invited to take foil packs and fill in questionnaires at three different times: immediately after survey participant recruitment (177 surveys received, 12 people refused the foil), after using the foil or returning to the facility (141 re-interviewed), and no earlier than 30 days after the second questionnaire was completed (89 re-interviewed). Intravenous use of heroin was common among the sample (practised on average for 10.4 years), but the majority of participants who received a ‘SMOKE-IT!’ pack were also familiar with smoking as a method of administering heroin. Close to half (45.4%) reported smoking heroin at least once a day and 72.4% smoked heroin several times a week. The high familiarity with smoking heroin likely contributed to the finding that DCR clients were overall accepting of the foil packs. Further, store-bought foils had already been available at the DCRs before the study. Participants were asked which type of foil they preferred and 85.5% favoured the ‘SMOKE-IT!’ foils over household foil. Many participants also said that they would be willing to pay for the ‘SMOKE-IT!’ foil if it was available.

Stöver and Schäffer (2014) suggested a number of ways in which programs might promote a ‘SMOKE-IT!’ type intervention including video tutorials, training courses on pipe/tube building, offering ‘SMOKE-IT!’ packs, providing informational literature (e.g., flyers, cards), and putting up eye-catching posters. The authors concluded that offering new types of drug use equipment is a way for programs to renew or generate new prevention messages and engage clients.

While encouraging, these types of evaluation need to be replicated in other places. In Canada, whether NSP clients have similar needs and would accept and use foil remains to be determined. This underscores the need for programs to evaluate and publish findings from any foil distribution initiatives undertaken.

Evidence about RTIs

In some places like the UK and the Netherlands, social marketing campaign approaches have been used to promote smoking instead of injecting heroin (Hunt et al., 1999; see also article by Kools at www.exchangesupplies.org/article_moving_from_fix_to_foil_dutch_experience_by_John-Peter_Kools.php). Although a full review of the literature on RTIs is beyond the scope of this chapter, it is important to acknowledge that research has explored reducing injection drug use as a main policy goal (e.g., Hunt et al., 1999). One approach towards this goal is to encourage people who currently inject drugs to transition to non-injecting routes of administration. However, evidence has been limited regarding the sustainability of the transition to “chasing the dragon” (Hunt et al., 1999) and it seems that changes in route of administration observed at population levels have been better explained by new users taking up smoking rather than people who inject making the transition (Griffiths et al., 1994). In the Netherlands, where many NSPs, DCRs, and drug treatment facilities are said to offer foil, there have been positive reports of clients switching from injecting to non-injecting drug use (see again online article by Kools). In a review of reviews, MacArthur et al. (2014) found no reviews of foil provision as an RTI, though they stated that this is unsurprising given that foil is still a relatively new intervention and primary studies might not yet be published. In practice notes regarding foil, Exchange Supplies (www.exchangesupplies.org) describes times and circumstances in the injecting career when people may be open to switching to smoking, including those who would smoke if they had foil available; recently started injecting; inject because a partner injects; have trouble with vein access; have recently started femoral (groin) injecting and/or are experiencing problems from femoral injecting; and have recently been through detox or released from prison. The perception among people who use heroin that smoking the drug may result in a less intense high is also an important consideration to discuss with clients if programs are aiming to dissuade injecting and/or encourage transitions away from injecting toward smoking or “chasing.”

In the study by Stöver and Schäffer (2014) described above, two-thirds (65.3%) of the sample reported using the new foils to smoke heroin instead of injecting it. When asked why they chose to smoke heroin using the foil, the reasons included: smoking was said to be “healthier than injecting” (58.9%), curiosity (49.1%), reduced risk of infection such as hepatitis and HIV (35.7%), and reduced risk of overdose (36.4%). Additionally, participants over age 39 were likely to

cite giving their veins a break as a reason for smoking heroin. Although these findings do not give evidence of complete transitions from injecting to “chasing,” they do show that people who use heroin are aware of some potential health-related benefits of smoking over injecting and are open to using foil as a way to reduce injection-related risks.

Given the limited evidence available, we are cautious about specific best practice recommendations regarding foil distribution, especially where it might be used as an RTI tool. Part of this caution stems from potential health risks associated with smoking drugs like heroin and smoking with foil, as discussed above. Encouraging transitions from injecting to smoking might reduce injection-related risks, but may lead to new smoking-related risks. We raise these issues because in communities across Canada crack cocaine smoking has been an increasingly important issue for harm reduction programs and is associated with a constellation of health and social risks. (For a full discussion, please see the Best Practice Recommendations: Part 1, Chapter 8: Safer crack cocaine smoking equipment distribution.) Research needs to explore if people who inject heroin or other opiates and who transition to smoking crack cocaine are exposed to new health and safety risks. Other concerns identified in the RTI literature include whether encouraging “chasing” would introduce new users to heroin (and, eventually, injecting) or might further stigmatise people who inject drugs or potentially dissuade them from accessing harm reduction programs (Hunt et al., 1999). For these reasons, distributing foil sheets on their own would not be a comprehensive RTI; if attempted, foil sheet distribution should be accompanied by a plan to identify and engage non-injecting heroin users – a population that might not be in regular contact with NSPs – and deliver education about the risks involved with “chasing the dragon” and smoking other drugs.

We recommend that harm reduction programs maintain close relationships with their clients and local communities to stay up to date on emerging drug-use trends and community/cultural acceptance of changes in practices, and any user-led initiatives or campaigns created in an effort to address emerging risks.

Other issues specific to foil sheets

Whether or not foil would be considered “drug paraphernalia” under Canadian law remains unknown. Speaking of the UK experience, Pizzey and Hunt (2008) noted that while providing foil for smoking might have been, in the absence of certain exemptions, technically forbidden under previous

law, no harm reduction service had been charged for providing non-exempt items to reduce drug-related harm. In the summer of 2014, it was announced that on September 5, 2014 the Home Secretary would add foil to the list of items that can be legally supplied to reduce drug-related harm.

Population specific considerations

This is another area in need of research and where harm reduction programs can monitor their client preferences. In their evaluation study, Pizzey and Hunt (2008) reported that while women comprised a minority of those who attended NSP services, they were more likely (62.3%) than men (44.6%) to take foil.

Foil distribution evidence summary

The evidence that informs this chapter and its recommendations is limited. Laboratory studies, including use of simulated smoking conditions, have contributed knowledge regarding the pharmacokinetics and bioavailability of smoking heroin. There is a need for more observational studies specific to people who smoke drugs like heroin and people who use foil sheets when doing so. There is also a need for evaluative studies about harm reduction program distribution of foil sheets, particularly in Canadian contexts.

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4 Safer crystal methamphetamine smoking equipment distribution



RECOMMENDED ACTIVITIES to evaluate the need to distribute safer crystal methamphetamine smoking equipment:

- Assess the prevalence of crystal methamphetamine smoking and related smoking and sexual harms in the community, especially among youth and men who have sex with men
- Determine how best to engage people who smoke crystal methamphetamine in harm reduction services and how to link directly to safer sex programming
- Assess the level of support among people who use drugs for distribution of safer crystal methamphetamine smoking equipment
- Assess education and other equipment needs within this population
- Obtain a legal opinion regarding distribution of safer crystal methamphetamine smoking equipment
- Evaluate and publish any initiatives undertaken

Rationale for distributing methamphetamine pipes as harm reduction

At the time of writing, there were a few Canadian harm reduction programs informally distributing equipment designed specifically for smoking crystal methamphetamine. Some programs distribute educational material regarding the risks of multi-person use of equipment used to smoke crystal methamphetamine. This chapter outlines available yet limited evidence to encourage programs to determine the need for and feasibility of safer crystal methamphetamine equipment distribution in the community. There is currently no biological evidence linking crystal methamphetamine smoking and transmission of HIV, hepatitis C (HCV), and other blood-borne pathogens. However, multi-person use of crystal methamphetamine smoking equipment is a similar behaviour to multi-person use of crack cocaine smoking equipment, which is believed to elevate the risk of blood-borne pathogen transmission. This similarity suggests the need to more fully assess the potential risk of transmission amongst those who smoke crystal methamphetamine (see Chapter 8: Safer crack cocaine smoking equipment distribution, in Strike et al., 2013, for full discussion and evidence).

Crack cocaine smoking equipment distribution programs have been implemented in some Canadian cities. These programs aim to use the distribution of smoking equipment as a means to engage people who smoke crack cocaine in harm reduction programs and to reduce their social and service isolation. A similar rationale might be considered to attract and engage new clients – including men who have sex with men (MSM) and youth – who use methamphetamine

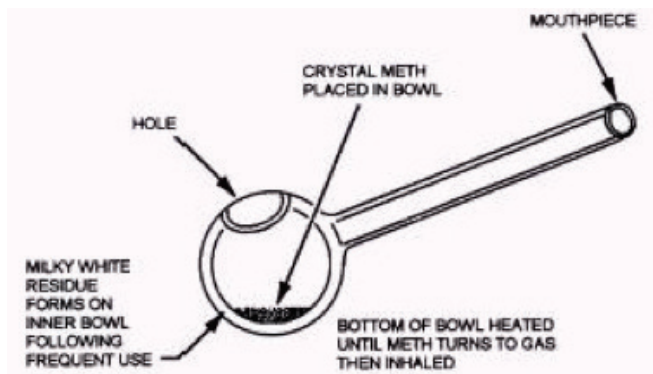
and who would benefit from education and other harm reduction services offered, including safer sex materials and information.

Some harm reduction programs encourage their clients to reduce injection-related risks by consuming drugs using other methods such as smoking. In the scientific literature, this is called a “route or reverse transition intervention” (RTI). Distribution of safer crystal methamphetamine smoking equipment might achieve this goal. However, there are two important cautions to consider. First, there is currently no evidence to support a claim that distribution of crystal methamphetamine smoking equipment would discourage its injection. Second, the relative risks of smoking versus injection of crystal methamphetamine are not fully understood. Smoking and injection of drugs are associated with different health risks. Positioning one route of drug consumption as “safer” than another can provide a false sense of safety for people who consume drugs. While injecting drugs can introduce pathogens directly into the bloodstream, people who smoke drugs such as crack cocaine experience different risks, social harms, and health issues than those who inject drugs; this may also be true for people who smoke crystal methamphetamine (Malchy et al., 2008).

Description of how methamphetamine is smoked using a pipe

Methamphetamine is a synthetic central nervous system stimulant that can be ingested via smoking, injecting, intranasal administration (snorting), or taken orally depending

on its form. Common street names include “meth,” “crystal meth,” “crystal,” “ice,” “speed,” and “crank” – “ice” and “crystal (meth)” are often used when the drug is in its smokable form (Anglin et al., 2000; Buxton & Dove, 2008; National Institute on Drug Abuse, 2006). The instruments used to smoke methamphetamine can vary, but typically people who smoke the drug heat it in a small, glass pipe and then inhale the resulting vapours. In a qualitative focus group study of 32 people who smoke methamphetamine recruited from community agencies in Toronto, participants reported commonly using store-bought “ball pipes” for smoking methamphetamine (Hunter et al., 2012).



Picture accessed from www.tpub.com/maa/12740_files/image130.jpg

Some reported using pipes or stems typically used for smoking crack cocaine, but these stems were considered unsuitable for smoking methamphetamine. According to Hunter et al. (2012), ball pipes were preferred because when heated, methamphetamine liquefies and turns into vapour that is then inhaled; the ball or bowl on the end of the pipe collects the liquid, preventing it from being inhaled and/or swallowed. When ball pipes are unavailable, people might construct makeshift pipes (e.g., out of light bulbs, soft drink cans) or convert crack cocaine stems into ball pipes by heating the stem and blowing out a ball on the end (Hunter et al., 2012); these practices may carry their own risks of injury or burns. When asked about what type of equipment should be distributed if a new program were implemented, participants recommended ball pipes made of durable glass or Pyrex because these materials are less likely to break. Also, participants noted that bowl size should be large enough to collect the liquefied methamphetamine and the “ventilation hole” should be large enough to allow oxygen into the bowl for vaporization, although the pipe itself should not be too large so as to make it more difficult to carry and conceal. There were differences of opinion regarding preferred stem length. While these findings came from a large urban

centre, it should be noted that people in rural settings may have little or no access to specialized ball pipes.

In the chapter regarding distribution of safer crack cocaine smoking equipment, we recommended distribution of mouthpieces. These are considered to be an integral piece of equipment because they help to prevent cuts and burns to the mouth and lips from crack cocaine pipes (Strike et al., 2013). There is very limited evidence to determine if high temperatures and damage to crystal methamphetamine pipes leads to a similar set of injuries among people who smoke crystal methamphetamine. Given evidence – see the section below – that people who smoke crystal methamphetamine share pipes, assessment of the need and/or desire for mouthpieces and their distribution is worth consideration.

In addition to pipes, other methods reportedly used to smoke methamphetamine include using foil and straws in a way similar to “chasing the dragon” and heating a crack cocaine stem and inhaling vaporized methamphetamine through the nose (“hot railing”; Hunter et al., 2012). However, it is generally unclear how commonly these methods are used. In a study of 100 street-involved youth in Toronto, Barnaby et al. (2010) reported that among those who smoked methamphetamine, 83% used a glass pipe, typically with a bowl on the end; 40% used a pipe made from a light bulb; 21% used tin foil; 19% used a crack cocaine pipe; and 8% used a metal pipe.

Evidence about smoking methamphetamine as a vector of transmission

People who use methamphetamine are at increased risk of HIV due to the relationship between the drug and sexual risk behaviours (Maxwell et al., 2006; see the section below on methamphetamine smoking and sexual risk behaviours for more detail). Recognizing that crystal methamphetamine and crack cocaine are different stimulants with different implications for people who use them, we extrapolate from the literature on sharing equipment for smoking crack cocaine to suggest that sharing pipes for smoking methamphetamine could also pose risks for pathogen transmission (see again Chapter 8: Safer crack cocaine smoking equipment distribution, in Strike et al., 2013, for full discussion and evidence). Although it is possible that there are fewer risks for smoking-related injuries like cuts and burns from smoking methamphetamine compared to smoking crack cocaine (e.g., due to less heat required, homemade pipes less common; Hunter et al., 2012), more research is needed to determine the level of risk.

Evidence of the prevalence of methamphetamine smoking and associated risk behaviours

When smoked, crystal methamphetamine is rapidly absorbed through the lungs and studies have found moderate to high bioavailability (Cook et al., 1993; Harris et al., 2003). Smoking crystal methamphetamine appears to be a common route of administration across various countries in the world (Farrell et al., 2002; Laidler & Morgan, 1997; Matsumoto et al., 2002).

Canadian estimates of crystal methamphetamine smoking are lacking in the literature. Estimates from the most recent I-Track study conducted with people who use drugs in cities across Canada showed wide variation in reporting of non-injection use of crystal methamphetamine in the past six months, varying from 5% to 37% of participants (unpublished data, 2011). An estimate of crystal methamphetamine smoking cannot be obtained from these data because routes of administration (i.e., smoking, intranasal, oral ingestion) were not collected.

Brands et al. (2012) surveyed 100 addiction treatment agencies in Ontario about methamphetamine admissions. Between 2004 and 2005, 53% of respondents reported an increase in clients with methamphetamine problems. Only 9% considered methamphetamine as a significant problem in 2005, while 60% reported that methamphetamine was a minor problem or not a problem. Further, Brands et al. (2012) found that admissions for methamphetamine peaked in 2005 (at 2.4% of admissions) and then dropped to a lower percentage of admissions between 2006 and 2008. Again, we lack Canadian estimates of methamphetamine smoking. Overall use of methamphetamine in the population appears low, though more national prevalence estimates are needed. Data from the Canadian Alcohol and Drug Use Monitoring Survey 2009 showed that only 0.1% of Canadians aged 15 and over reported methamphetamine use in the prior year (Health Canada, 2009).

In contrast, American and some international data have shown increases in methamphetamine use and smoking. For example, looking at emergency room data from the Drug Abuse Warning Network (DAWN), amphetamine/methamphetamine emergency department visits increased considerably (54%) between 1995 and 2002 (Substance Abuse and Mental Health Services Administration, 2003). In terms of studies based on treatment admissions data, Maxwell et al. (2006) compared drug treatment admissions along the US-Mexico border and their US data indicated that the percentage of people who reported smoking methamphetamine

increased from 22% in 1996 to 56% in 2003, while the proportions of those inhaling and injecting the drug declined over the same period. The prevalence of smoking also increased in Mexico, from 45% in 1997 to 71% in 2003. In a study that examined California data on non-coerced methamphetamine treatment admissions, Cunningham et al. (2008) reported that between 1992 and 2004 snorting, smoking, swallowing, and injecting methamphetamine admissions had initially risen sharply and then dropped when a 1995 ephedrine (a precursor chemical commonly used in methamphetamine production) regulation was introduced. Snorting, swallowing, and injecting stayed at lower levels throughout the study period, but smoking made a resurgence when a regulation regarding ephedrine with other medicinal ingredients was implemented in 1996, and then continued to rise. The authors concluded that changes in methamphetamine route of administration were associated with precursor regulation and, potentially, linked to regulation impacts on both US and Mexican methamphetamine production.

In a serial cross-sectional study conducted in three waves (1996-1997, 1999-2000, and 2003), Das-Douglas et al. (2008) examined methamphetamine trends among 2,348 homeless and marginally housed participants recruited in San Francisco. Overall, the authors found nearly a tripling in the proportion of people (from 5.7% to 15.1%) reporting any methamphetamine use from 1996 to 2003. Injecting was the most common route of administration and the proportion of participants who reported injecting was 3.9% in 1996-1997 and 9.3% in 2003. However, smoking had the largest increase as the proportion of those who reported smoking methamphetamine increased sevenfold, 1% in 1996-1997 and 7.1% in 2003. Das-Douglas et al. (2008) observed methamphetamine use increases across all routes of administration in almost all participant subgroups, with the largest increases seen in HIV-infected participants, adults under age 35, non-injecting drug users, heavy drinkers, and people reporting three or more sexual partners in the last year.

Kinner and Degenhardt (2008) reported on annual, national data collected from 750 regular ecstasy users in Australia. Recent methamphetamine use was reported by 81% of those interviewed in 2006. Across Australian jurisdictions in the study, the proportion of people reporting smoking methamphetamine greatly increased between 2000 and 2006. Evidence about the frequency and social processes associated with sharing pipes used to smoke methamphetamine is limited. Hunter et al. (2012) noted that among Toronto study participants, sharing methamphetamine pipes was

“common and widespread” at the parties and/or bathhouses they attended. Sharing was considered “automatic” in these settings. Many participants were unconcerned about potential health harms related to sharing. More often, participants expressed concern that if they shared a pipe, the person(s) might: damage or break the pipe and render it unusable, smoke more than their share of the drug, and/or burn and waste the drug. In another qualitative study involving approximately 60 young adults who used methamphetamine and other drugs and were connected to the electronic music scene in Perth, Australia, Green and Moore (2013) reported that arguments sometimes occurred in “meth circles” over undesirable group behaviours such as someone keeping the pipe too long or not passing quickly enough. These studies suggest that methamphetamine is not only smoked in group settings, but that certain settings have norms endorsing pipe sharing instead of individual group members using their own pipes.

In a study of 400 methamphetamine treatment entrants in Sydney and Brisbane, Australia, McKetin et al. (2008) found that 42% had smoked the drug, 79% injected the drug, and 25% both smoked and injected the drug in the month prior to entering treatment. (The sample excluded participants who had not used methamphetamine or had only used orally or intranasally in the month prior to treatment.) McKetin et al. (2008) compared people who injected methamphetamine with people who injected and smoked the drug, and the two groups were very similar in terms of sociodemographic and drug use characteristics. People who both inject and smoke were less dependent on the drug; however, they also used methamphetamine more often than other injectors. Further, people who both inject and smoke did not show significantly less injection drug use or needle sharing compared to other injectors.

Evidence about the link between methamphetamine smoking and sexual risk behaviours

The euphoria experienced from methamphetamine use is the result of dopamine released in the brain (Anglin et al., 2000). In addition to the high, people have reported using methamphetamine for various physical, psychological, and emotional reasons – including enhancing sexual experiences (Hunter et al., 2012). Methamphetamine use is also associated with sexual risk behaviours and a specific population that has been studied in relation to this robust finding are MSM, as the drug has been relatively popular within this diverse population (e.g., Carey et al., 2009; Halkitis et al., 2007; Mansergh et al., 2006; Wong et al., 2005).

Methamphetamine is sometimes used along with sildenafil (commonly known as Viagra, an orally administered medication used to treat erectile dysfunction) and this combination is associated with higher risk sexual behaviour (Fisher et al., 2010, 2011; Prestage et al., 2009; Semple et al., 2009; Spindler et al., 2007). In a cross-sectional study of 1,976 MSM in San Francisco surveyed by telephone, Spindler et al. (2007) found that 7.1% used methamphetamine without Viagra and 5.1% used methamphetamine with Viagra. Among the latter group, 57% reported being HIV-infected and 24% of these participants reported having “serodiscordant unprotected insertive intercourse.” Fisher et al. (2011) examined use of methamphetamine and Viagra among men recruited from HIV prevention and HIV and sexually transmitted infection (STI) testing programs in Long Beach, California. Data were collected between May 2001 and July 2007, and out of 1,794 complete cases in the study, 11.1% had used both methamphetamine and Viagra. Men who used both substances showed significantly higher prevalence of HBV, untreated syphilis, and HIV compared to men who used one or neither drug. Viagra use was associated with insertive anal intercourse while methamphetamine use was associated with receptive anal sex. Fisher et al. (2011) reported that being heterosexual was a protective factor, although even heterosexual men who took both Viagra and methamphetamine had (not significantly) elevated frequencies of insertive anal sex. In a short review, Fisher et al. (2010) noted that methamphetamine use has also been associated with high-risk sexual behaviours among heterosexual people. Together these studies show a robust link between methamphetamine use and sexual behaviours associated with HIV and STI transmission, but these studies did not specifically focus on or analyse data with a specific focus on people who smoke methamphetamine.

Semple et al. (2009), however, noted that among a sample of 341 HIV-positive MSM who use methamphetamine and were enrolled in a sexual risk reduction intervention in San Diego, the most common routes of methamphetamine use were smoking (80%) and snorting (78%). Semple et al. (2009) explored the phenomenon of marathon sex (i.e., prolonged sexual activity occurring over hours or days) among these MSM and found that 84% reported engaging in such activity while using methamphetamine. Compared to men who did not engage in marathon sex, those who did were more likely to use Viagra and significantly more illicit drugs. Unprotected oral and anal sex was also common among those who engaged in marathon sex. In the study mentioned above, McKetin et al. (2008) also compared people

who inject methamphetamine to people who only smoke methamphetamine and found that smokers engaged in more sexual risk behaviours (i.e., more likely to have had more than one sexual partner and to have had unprotected sex with more than one person in the month prior to treatment). This study included men and women. Compared to those who inject, people who smoke methamphetamine were significantly younger and more likely to be female.

Other health-related harms

Methamphetamine use can have acute negative side effects including increased body temperature, cardiac arrhythmia, stomach cramps, risk of stroke, anxiety, insomnia, feelings of paranoia, and aggressive behaviour (Anglin et al., 2000; NIDA, 1998). Prolonged use may also lead to irritability and psychosis, called “tweaking” (Buxton & Dove, 2008). The oral effects from using the drug (e.g., dry mouth from smoking, teeth grinding and jaw clenching), when coupled with poor oral health, can accelerate dental decay (Buxton & Dove, 2008). Long-term use of methamphetamine can lead to changes in the brain, and thus affect cognitive and motor functioning (NIDA, 2006). As discussed above, due to sexual risk behaviours, people who use methamphetamine are at risk for HIV and a range of other STIs.

With prolonged use, users can develop a tolerance that requires them to increase their dosage to obtain the same effect; over time, dependence or addiction may develop (NIDA, 2006). Because smoking delivers drugs to the brain quickly, this route might increase the risk of dependence over routes such as snorting or swallowing (Cook et al., 1993; McKetin et al., 2006). However, some studies have found that people who smoke methamphetamine were less likely to report dependence compared to people who inject the drug (Matsumoto et al., 2002; McKetin et al., 2006). Discontinuing methamphetamine use can result in fatigue, depression, anxiety, and intense cravings (NIDA, 2006). Methamphetamine dependence can be difficult to treat (Anglin et al., 2000). Different treatment modalities have been used and are being investigated, including pharmacotherapies (Vocci & Appel, 2007). In a randomized clinical trial of treatments for methamphetamine dependence, Hillhouse et al. (2007) found that people who smoke methamphetamine were difficult to engage and retain in treatment, although smoking did not seem to predict poor post-treatment outcomes. McKetin et al. (2008) noted that differences between people who smoke methamphetamine and those who inject the drug illustrate a need for “multi-faceted” treatment responses, including services appropriate for people who may exhibit less dependence but are at increased risk of drug-related

harms. Brands et al. (2012) found that most (89%) of the addiction treatment agencies they surveyed in Ontario integrated their methamphetamine clients into their regular programs and that 73% of agencies had not considered establishing specific or tailored methamphetamine programs.

Methamphetamine pipe distribution

Given limited evidence, it is difficult to determine whether provision of ball pipes for smoking methamphetamine would be taken up by program clients and would be used to reduce pipe sharing. In their qualitative study, Hunter et al. (2012) asked for feedback from participants about contents of potential safer methamphetamine smoking kits. A wide array of items was suggested, including – among others and in addition to ball pipes – lighters, foil, hand sanitizer, condoms, lubricant, lip balm, and educational pamphlets. A study of 100 street-involved youth in Toronto reported that 74% of participants said that provision of safer methamphetamine use kits would be a high priority (Barnaby et al., 2010). However, participants in the Hunter et al. (2012) study – especially those who identified as gay men – were not sure whether distributing such kits would reduce pipe sharing and change their own behaviour, due to the social aspect of sharing pipes at parties and that pipe sharing is also part of the sexual experiences and transactions that occur in bathhouses. Thus, there are unanswered questions about uptake that require further research and evaluation.

Even if distributing ball pipes or safer methamphetamine kits would not greatly reduce pipe sharing, such efforts may reduce instances of homemade pipes that are likely to break and/or cause injury or burns (Hunter et al., 2012), though again research is needed to examine this possibility. Further, targeting locations where methamphetamine smoking may take place (e.g., late-night clubs, bathhouses) and providing safer smoking equipment and information may reach populations that are currently underserved, but would benefit from harm reduction programs. Hunter et al. (2012) concluded that there is reason to pursue “a broad health promotion and prevention program for people who smoke crystal methamphetamine” (p. 7) to also address some specific concerns within this population (e.g., use of the drug to cope with food insecurity, to manage mental health issues).

Other issues specific to distribution of crystal methamphetamine smoking equipment

Whether or not crystal methamphetamine pipes would be treated as “drug paraphernalia” under Canadian law remains unknown. However, it might be reasonable to assume

that pipe distribution would create some controversy, as has been the experience in some Canadian jurisdictions regarding crack cocaine smoking equipment (Canadian HIV/AIDS Legal Network, 2008).

Population specific considerations

Different groups smoke crystal methamphetamine, but there is limited evidence regarding potential population-specific differences in usage patterns. This topic deserves more research. Harm reduction programs ought to consider how their typical clients (e.g., people who inject drugs) may be unlike people who smoke crystal methamphetamine and should consider ways of engaging the latter in services.

Based on the above evidence regarding risk behaviours, MSM represent a specific population in relation to methamphetamine smoking that harm reduction programs should consider. Consideration may entail developing messages for clients around methamphetamine use with and without other substances (including Viagra) and encouraging safer sex supply use and practices.

Youth – including those who identify as lesbian, gay, bisexual, transgender, or queer (LGBTQ) – comprise another specific population worth considering in relation to methamphetamine use. In 2003, Lampinen et al. (2006) conducted a pilot survey of high-school students, grades 9 through 12, in Vancouver and Victoria, British Columbia. Among 590 students, 2.5% identified as gay, lesbian, or bisexual and these students were at increased risk for reported use of crystal methamphetamine, ecstasy, and ketamine. Martin et al. (2006) recruited a convenience sample of street-involved youth and LGBTQ youth (under age 30) in Vancouver and Victoria. Eighty-five (67%) of the 126 street-involved youth and 13 (24%) of the 54 LGBTQ youth who completed surveys reported ever having used methamphetamine. Most of these participants first used methamphetamine before they turned 20 and the majority had used the drug during

the previous month. Smoking was the most common route of administration for both the street-involved and LGBTQ groups, followed by snorting; LGBTQ youth had a higher prevalence of oral and rectal administration of the drug. Martin et al. (2006) noted that, “Anecdotally, [smoking methamphetamine] is perceived as a safe alternative to injection drug use” (p. 323). However, youth who start by smoking methamphetamine may eventually transition to injecting it or other drugs. Wood et al. (2008) examined first use of methamphetamine among street-involved youth in Vancouver who were enrolled in the prospective cohort, At-Risk Youth Study (ARYS). A majority (70.9%) or 339 of the 478 participants had previously used methamphetamine. Among these participants, route of first methamphetamine administration included 231 (68.1%) who smoked, 105 (31%) who snorted, 25 (7.4%) who injected, and 11 (3.2%) who consumed orally. Methamphetamine use was independently associated with injecting drugs and, when use patterns were examined longitudinally, significant increases in injecting were observed (including transitions from smoking). Further, it was reported that methamphetamine was the drug used in about 25% of injection initiation episodes and nearly all of these participants had previous non-injecting experience with methamphetamine.

Safer crystal methamphetamine smoking equipment distribution evidence summary

The evidence base that informs this chapter and its recommendations is limited. Much of the evidence incorporated into this chapter came from cross-sectional studies, contributing primarily data on methamphetamine use patterns and risk behaviours (and, namely, sexual risk behaviours). Several review articles provided context on methamphetamine use. Other study types varied and included one randomized clinical trial, prospective cohort studies, qualitative research (e.g., focus groups and interviews), and laboratory studies.

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5 Injection-related complications – prevention, assessment, and treatment



RECOMMENDED BEST PRACTICE POLICIES to prevent, assess, and treat injection-related complications (IRCs):

- Educate clients about factors that can lead to IRCs and how to prevent and treat IRCs
- Develop and implement assessment, treatment, and referral protocols for IRCs
- Train staff at needle and syringe programs (NSPs) and satellite sites to identify and provide education about IRCs to clients
- Assess the prevalence of IRCs
- Evaluate and publish any IRC interventions undertaken

People who inject drugs can experience numerous injection-related health problems, including abscesses (pockets of pus in/under the skin), ulcers (open areas on the skin), venous insufficiency, thrombophlebitis (clot formation in veins), endocarditis (infection and/or inflammation of the heart), swollen hands, osteoarthritis (breakdown of bone cartilage and bone), bacteremia (bacterial infection of the blood), and scarring of the skin (Del Giudice, 2004). For discussion of other IRCs such as “cotton fever”, please see the Best Practice Recommendations: Part 1, Chapter 3: Filter distribution (Strike et al., 2013). NSPs with access to physicians and nursing staff can help to address these IRCs through education and by offering or facilitating timely access to treatment. Harm reduction programs are known to play an important role in the prevention of IRCs. For example, an evaluation of an NSP in Eureka, California found that increased numbers of needles exchanged and total number of visits to the NSP resulted in fewer numbers of injection-related abscesses treated in the community (Tomolillo et al., 2007).

Prevalence of IRCs

Reports of IRC prevalence vary widely in part due to differing definitions of complications and time periods reported in the literature. A Vancouver study found the prevalence of developing an abscess among a cohort of 1,585 people who inject drugs was 21.5% over a 6-month period (Lloyd-Smith et al., 2005). From another analysis of cohort study data from Vancouver, Lloyd-Smith et al. (2008) found that the proportion of people who inject drugs with skin-related complications remained under 10% between Jan 1, 2004 and Dec 31, 2005. A retrospective review of 122 necrotizing deep skin and subcutaneous tissue infections from a single

emergency department in Oakland, California found that 80% were associated with injecting drugs; and highlighted the significant risk of necrotizing infections (infections that cause tissues to die) for people who inject drugs (Frazee et al., 2008).

IRC Development

Risk factors for IRC development belong to the following broad categories:

- Drug form (e.g., pills may contain bulking agents that can lodge under the skin)
- Contamination of drugs (e.g., contaminated with disease-causing bacteria)
- Contamination of injection equipment and skin
- Injection sites (e.g., the neck, groin, or hands)
- Methods of injecting (e.g., “skin popping” and “muscle popping”)
- Missed injections (e.g., intravenous injection intended, but vein was missed and injection occurred in surrounding tissue)
- Length and frequency of injection and assistance with injecting
- Social, demographic, and health factors (e.g., sex work, unstable housing, and hepatitis C infection)

It is important to understand that many of the factors noted above can occur concurrently and increase the risk of harm. Safer injection education is therefore important throughout the individual's injecting career – from initiation to long-term use. For general guidance on education at harm

reduction programs, please see Chapter 10: Safer drug use education, in Strike et al. (2013).

IRCs and drug form

Injection of prescription drugs for non-medical reasons has increased in Canada and other jurisdictions (Fischer et al., 2009). Prescription drugs, such as oxycodone and bupropion (Wellbutrin), are manufactured for oral consumption and contain ingredients such as powders and bulking agents that are not intended for intravenous use. These ingredients do not easily dissolve in water or with acidifiers and can clog needles or become lodged in the skin (Dwyer et al., 2009). Few studies have examined the prevalence of IRCs associated with injection of oral prescription drugs. One large survey of 1,461 people who inject drugs from across Australia found that injecting oral pharmaceuticals was independently associated with injection-related problems (Topp et al., 2008).

Use of filters during the preparation of drugs for injection may reduce the volume of these ingredients entering the bloodstream (Dwyer et al., 2009). For further guidance on use of filters, please see Chapter 3: Filter distribution, in Strike et al. (2013).

Injection of prescription drugs in ways other than intended can also be lethal. In 2013, deaths due to intravenous use of bupropion led to an official alert from the Chief Coroner of Ontario. At least six deaths were attributed to inhalation or injection of this drug. The Coroner noted that injection of the prescription drug was associated with tissue necrosis (cell death) at the injection site, which may have been a cause of death (Cass, 2013). Currently, only two case reports exist in the medical literature regarding the injection of this drug (Beribeau & Araki, 2013; Oppek et al., 2014), and the authors of both reports highlight the need for awareness of emerging trends.

Other studies have linked speedballs (a mixture of heroin/opioids and crack cocaine) to the development of abscesses when compared to injection of heroin/opioids alone (Lloyd-Smith et al., 2008; Phillips & Stein, 2010).

IRCs and contaminated drugs

Practices during manufacturing may contaminate illicit drugs and lead to IRCs. A UK review of abscesses and soft tissue infections between 2000 and 2004 among people who inject drugs found that spore-forming bacteria such as *Clostridium botulinum* in black tar heroin were responsible for

the development of local and systemic infections (Brett et al., 2005). Other spore-forming bacteria such as *Clostridium tetani* can also contaminate drugs through dirty handling, processing, or through contaminated additives (Hahné et al., 2006). This study highlights the importance of tetanus vaccination for people who inject drugs because they can also be exposed to this pathogen through drugs. Wound botulism currently remains a risk of injecting drugs. Between December 2014 and February 2015, 23 cases of wound botulism were reported in Norway (eight cases) and Scotland (15 cases) among people who inject drugs (European Centre for Disease Prevention and Control, 2015).

IRCs and contaminated skin and/or injection equipment

Contamination on the skin surface has also been found to influence development of IRCs. In a case-control study involving 151 people who inject drugs, cleaning skin with alcohol was shown to reduce the odds of IRCs (OR 0.48, 95% CI 0.32-0.74; Murphy et al., 2001). Similar findings were reported in a survey of 1,057 people who inject drugs in Baltimore, whereby participants who always cleaned their skin (with alcohol, soap and water, iodine or other means) had a lower frequency of endocarditis when compared to individuals who never cleaned (0.6% vs 1.6%; Vlahov et al., 1992). Microbes from the mouth can also be introduced into drug solutions if pills are crushed by chewing (Gordon & Lowy, 2005). Licking needles before injecting can also introduce oral bacteria below the skin (Binswanger et al., 2000; Gordon & Lowy, 2005).

Poor hand hygiene is also linked with IRCs. In a cross-sectional survey of 393 people who inject drugs across six sites in Australia, inconsistent hand-washing practices were independently associated with serious IRCs in the year preceding the study (AOR 9.3, 95% CI 2.1-41.8); poor hand hygiene was also associated with multiple IRCs in the same period (AOR 1.9, 95% CI 1.2-1.9; Dwyer et al., 2009). This study also found that protective factors against the development of non-serious complications were always self-injecting (AOR 0.30; CI 0.10-0.84) and always using sterile water in the previous four weeks (AOR 0.46, CI 0.22-0.97; Dwyer et al., 2009).

Reuse of injection equipment can lead to IRCs and aid in the transmission of blood-borne pathogens. A Vancouver study of 1,065 people who inject drugs found that borrowing a used syringe was associated with higher odds of developing a soft tissue or skin infection (AOR 1.60, CI 1.03-2.48; Lloyd-Smith et al., 2008). Participants who reported requiring help to inject were also at greater risk of developing an IRC

(AOR 1.42, CI 1.03-1.94). In a study of 200 people who inject drugs in Sydney, Australia, sharing equipment was also significantly associated with development of IRCs (Darke et al., 2001). There is little research examining the effects of needle reuse on the physical structure of a needle tip and its role in IRC development. A major manufacturer of needles and syringes in Canada notes, however, that reuse of needles may present risk of IRCs through weakening and dulling of needle tips that are meant to be single use only (see BD website at www.bd.com/ca/diabetes/english/page.aspx?cat=14501&id=14766). In addition, damaged tips of used needles may break off under the skin, causing more tissue injury.

Improving hand hygiene, cleaning skin with alcohol prior to injection, and avoiding all reuse of injection equipment can therefore reduce the incidence of IRCs.

IRC and methods of injecting

“Muscle popping” (intramuscular injecting) and “skin popping” (injecting into the fatty layer of tissue below the skin) have been linked to IRCs (Murphy et al., 2001). The review of an outbreak among people who injected black tar heroin in California found that necrotizing fasciitis was associated with muscle and skin popping (Kimura et al., 2004). These methods of injecting can also create small pockets of fluid that exert pressure on the surrounding tissues, leading to reduced blood flow and ultimately cell death; localized effects of the drug and trapped bacteria in these tissues further compound the risk of abscess formation (Murphy et al., 2001).

“Booting,” “kicking,” “flushing,” or “flagging,” the practice of drawing in and re-injecting blood with a syringe, is linked to soft-tissue infections (Brunsdon, 2010; Greenfield et al., 1992). People who inject drugs may “boot” to ensure the needle is in a vein, to “force the drug around the body faster,” and/or to ensure that all of the drug solution in the barrel is pushed into the vein (Brunsdon, 2010). However, when the plunger is pulled back, the vein may contract slightly and the needle may move and scrape the inside of the vein, later leading to scarring and vein hardening (Brunsdon, 2010). The literature we reviewed for this chapter does not differentiate between “flagging” and “booting.” It might be important to highlight for service users that “flagging” occurs when a small amount of blood appears in the barrel near the needle hub. Filling the barrel with blood is considered “booting” (Lampkin, personal communication, 2015).

A few studies have reported on the links between “booting,” skin popping, and IRCs. A case-control study of 151 people who inject drugs in San Francisco, California (267 in case-control group), found that abscess formation in the previous year was associated with a higher frequency of skin popping (OR 6.13, CI 3.51-10.70), “booting” with skin popping (OR 1.56, 1.13-2.14) or without skin popping (OR 2.33, 1.46-3.70; Murphy et al., 2001). In another study of people who inject drugs from the San Francisco area, Binswanger et al. (2000) found increased odds of IRCs associated with skin popping (OR 4.9, 2.2-11.4). A review of soft-tissue infections caused by spore-forming bacteria in the UK from 2000 to 2004 also found that subcutaneous or intramuscular injecting carried the highest risk for developing soft-tissue complications such as necrotizing fasciitis (Brett et al., 2005).

The use of lemon juice to dissolve drugs such as crack cocaine into an injectable solution has been linked with IRCs (Waninger, 2008). A qualitative study of 44 UK groin injectors found that the accounts of vein damage were related to a combination of “speedballs” and “missed hits,” numbing of the skin caused by contact with crack cocaine and excessive use of citric acid (Rhodes et al., 2007).

Injecting into tissues other than veins can increase the risk for development of IRCs; NSPs may need to develop more educational resources to address injecting practices.

IRC and injecting career

Research shows links between the length of drug injecting careers (including frequency of injection) and the development of IRCs. An Australian study found that the frequency of injecting in the month previous to the study and the number of current injection-related problems were significantly correlated ($r = 0.20$, $p < 0.005$; Darke et al., 2001). Another Australian study of 393 people who inject drugs found that injecting daily or more often (AOR 1.7, 95% CI 1.7-2.2) was independently associated with IRCs in the year preceding the study (Dwyer et al., 2009). Data from a survey of 1,961 Australian people who inject drugs reported that daily or more frequent injecting was independently associated with IRCs (Topp et al., 2008). Inexperience with injecting drugs has also been linked to IRCs. In 2008, a study of people who inject drugs from the Vancouver area found that requiring help injecting (AOR 1.142, CI 1.03-1.94) was independently associated with an increased risk of injection-related skin infections (Lloyd-Smith et al., 2008).

IRCs and injection sites

Injecting into sites such as the groin or the neck carries higher risk because the blood vessels (both veins and arteries) in these areas are larger and difficult to see when injecting; any damage to veins at these sites can therefore impact systemic circulation (Darke et al., 2001). An Australian study showed that over time there was a progression of injecting from the crook of the elbow to the forearm (two years after injection initiation) and upper arm (3.5 years after initiation; Darke et al. 2001). Use of the hand as an injection site occurred about four years after initiation; the foot, neck, and leg occurred six years after initiation; and use of the groin and digits (fingers and toes) occurred 10 years after initiation (Darke et al., 2001). Another Australian study of 393 people who inject drugs found that injecting into three or more sites (AOR 1.5, 95% CI 1.1-2.0) and injecting into sites other than the arms (i.e., groin, etc.; AOR 1.7, 95% CI 1.3-2.2) were independently associated with IRCs in the year preceding the study (Dwyer et al., 2009). A review of arterial complications of drug use found that groin injecting could lead to injection into the wall of the femoral artery or tissues around the artery ("missed hits"); and subsequently resulted in abscesses and potentially life-threatening rupture of arteries (Coughlin & Mavor, 2006). Injecting into the groin can also have long-term consequences. Injecting into the femoral veins increases the risk of chronic venous disease, a painful and potentially debilitating condition in the lower extremities (Pieper et al., 2007).

Injection into larger muscle groups such as the thighs, buttocks or the deltoid is also associated with IRCs. A study conducted between November 1999 and April 2000 that examined healthcare utilization among 242 people who inject drugs from Seattle, Washington, found that 72.3% had abscesses that required visits to the hospital (Takahashi et al., 2003). Cellulitis was only located in the arm or leg; most abscesses were located in the arm, deltoid, or buttock (81.1%); and 59% of individuals with deltoid abscesses and 45% with buttock abscesses required hospitalization. The authors of this study noted that deltoid abscesses were often due to intramuscular injecting and had the potential to become deep infections. The lack of blood vessels near the skin surface in the buttocks likely led to injecting deep into the muscle and resulted in abscesses (Takahashi et al., 2003).

Finally, there are medical reports of individuals maintaining and injecting into a "shooter's patch" (i.e., open ulcer on the skin that has a good supply of blood; Hasanovic et al., 2013; Iyer et al., 2012). Maintenance of such an open wound on the skin for injection may increase the risk for serious infection.

The choice of injection site is another means through which IRCs may develop. Educating clients about safer injection techniques and rotating injection sites may also help to reduce IRCs.

IRCs, comorbidities, and socio-demographic factors

A number of socio-demographic factors have been linked to IRCs. A study of people who inject drugs in Vancouver found that female gender (OR 1.7, CI 1.2-2.4, $p=0.002$), recent incarceration (OR 1.7, CI 1.3-2.2, $p<0.001$), sex work involvement (OR 1.4, CI 1.0-2.0, $p=0.03$), and HIV serostatus (OR 1.5, CI 1.2-2.0, $p=0.003$) were associated with having an abscess (Lloyd-Smith et al., 2005). A later study found that unstable housing (AOR 1.49, CI 1.10-2.03) was also associated with an increased risk of injection-related skin infections (Lloyd-Smith et al., 2008).

Comorbid health conditions that have an impact on the immune system have also been implicated in the development of IRCs. A study of 1,961 people who inject drugs from 45 NSPs across Australia concluded that HCV antibody positive serostatus was independently linked to IRCs (Topp et al., 2008). Since immune system degradation may occur naturally through aging, it has also been proposed that older age may also predispose individuals to IRCs (Dwyer et al., 2009).

Self-management and NSP services for skin and veins

Since IRCs are common among people who inject drugs, self-management of complications has been explored in the research literature. In a study of 101 participants from Washington DC, 81.2% reported ever having a wound and 93.9% reported self-management (Roose et al., 2009). The most commonly reported practices included cleaning and applying ointment to wounds. A number of participants engaged in behaviours that were deemed to carry higher risk such as acquiring antibiotics without a prescription, "manipulating their wounds" (i.e., squeezing or picking abscesses), and using hot water to wash out the "core" of an open abscess. Statistical analyses also found that people who injected amphetamines were more likely to engage in these harmful self-management behaviours (AOR 4.38, CI 1.15-16.64; Roose et al., 2009). Given these findings, it is important to advise program clients on identification of IRCs and appropriate wound management. Since people who inject state that assessment of injection sites by physicians and nurses are an acceptable and important component of ongoing care (Small et al., 2008; Winstock et al., 2009), skin and vein services can be incorporated into NSPs that offer medical and/or nursing care.

Studies of skin and vein care services for people who inject drugs are rare, however, and those reviewed reported diverse approaches. For example, Grau et al. (2002) reported on a clinic in Oakland, California, affiliated with an NSP that was staffed by volunteers (physicians, nurses, emergency medical technicians, and untrained individuals). Overall, 57% of all clients received oral antibiotics, while 47% received topical treatments for IRCs. Referrals for ongoing treatment and follow-up were also essential components of this program. Just over half of the clients required more than two referrals for follow-up related to wounds and primary care (56%). Word of mouth and information cards inserted into kits spread knowledge about the program in the immediate community and surrounding areas.

Another type of program provided wound care through outreach and mobile services. In response to high rates of abscesses and chronic wounds in clients, in 2012 the Baltimore NSP partnered with the Johns Hopkins Wound Healing Centre to establish a mobile wound clinic (Robinowitz et al., 2014). The clinic provided wound care to the NSP clients and over 16 months 78 unique individuals were treated (over 172 visits). Placement of the wound clinic within an already established program was seen as a means to overcome barriers such as cost, transportation and stigma, and also allow the clients to receive specialized wound care. Between May 2012 and August 2013, the majority of wounds treated were chronic (67.4%), while 30.2% were acute wounds or abscesses. Treatments provided included wound assessment, cleaning, incision and drainage of abscesses. Evaluation of the program revealed that it was cost-effective, reduced emergency department visits and provided necessary wound management, particularly for people living with chronic wounds. Authors of this evaluation noted a number of challenges, however, in the operation of this service. The lack of space limited services to one client at a time, client retention and follow-up were difficult because many patients could not be contacted by telephone, and many clients faced challenges in caring for their own wounds due to poor access to clean water and unstable housing.

Finally, wound services for people who inject drugs need not only be located within NSPs. A high number of injection-related soft tissue infections in the community led to San Francisco General Hospital in California establishing the Integrated Soft Tissue Infection Services (ISIS; Harris & Young, 2002). Statistical analyses revealed that the ISIS clinic significantly reduced emergency department visits by 33.9% and hospital admissions for soft-tissue infections by 33.7%. Most significantly, the authors of the study found that few patients were lost to follow-up (14%). NSP programs may need to explore referral pathways to specialized wound care programs that are staffed with medical personnel.

While these three programs utilize different approaches to the provision of skin and vein services, they highlight three critical components of an effective skin and vein program for people who inject drugs:

1. Service staffed by medical personnel (doctors and nurses) who provide specialized care (including prescription of antibiotics and surgical interventions)
2. Timely referrals
3. Advertising of the service

Injection-related complications – prevention, assessment, and treatment evidence summary

The evidence presented in this chapter comes from a variety of sources. The majority of evidence related to IRCs is from cross-sectional studies of people who inject drugs. Case reports have also been used to highlight emergent skin and vein issues for people who inject drugs. Reviews have been used to condense the large body of medical literature on IRCs encountered in clinical practice. Few studies exploring skin and vein care services were found in the research for this chapter and only a small body of literature about skin and vein care interventions suggests the need for more reporting and research into this aspect of service provision.

As the delivery and evaluation of skin and vein care increases, we anticipate more evidence to support NSPs in developing and implementing robust evidence-based services.

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6 Testing services for HIV, hepatitis C, hepatitis B, and tuberculosis



RECOMMENDED BEST PRACTICE POLICIES to increase clients' knowledge of their HIV, hepatitis C (HCV), hepatitis B (HBV), and tuberculosis (TB) infection status, and to prevent further transmission of infectious disease by facilitating access to testing and screening supports:

- Educate clients about the benefits of regular testing, early diagnosis, and treatment for HIV, HCV, HBV, and TB
- Educate clients about the types of testing available to facilitate informed choice
- Refer clients to testing and counselling service providers in the community
- Establish and maintain relationships with a variety of testing and counselling service providers, in particular those with experience working with people who use drugs
- Implement onsite counselling (pre and post) and voluntary testing services for HIV, HCV, HBV, and TB according to municipal, provincial, and federal regulations and guidelines
- Evaluate and publish any testing interventions undertaken

Testing for people who use drugs

Socio-sexual behaviours and less safe drug use (e.g., sharing drug equipment) combine to elevate the risk of infection and pathogen transmission for people who use drugs; pathogens of particular concern are HIV, HCV, HBV, TB, syphilis, chlamydia, and gonorrhoea. The spread of syphilis, chlamydia and gonorrhoea is primarily sexual, whereas HIV, HCV, and HBV can gain entry through sexual intercourse and several other routes (e.g., injections occurring intravenously, intramuscularly, and subcutaneously). The risk of TB is primarily related to socio-economic factors such as crowding and inadequate nutrition, and to existing conditions that suppress immune system response (e.g., HIV). Inconsistent medical care and hesitation toward revealing drug use may elevate delayed recognition of infection and disease risk and associated morbidity. Research has already demonstrated that people who inject drugs are at greater risk, compared to people who do not inject drugs, for delayed initiation of medical care after receiving results of HIV seropositivity (Torian et al., 2008). They are also frequently diagnosed in the later stages of the disease (Grigoryan et al., 2009). Later diagnosis increases the chances of severe immune-compromise and death, and concurrent HIV/AIDS diagnosis (i.e., diagnosis of AIDS within one month of initial HIV diagnosis) carries twice the risk of death within four months after diagnosis (Hanna et al., 2008).

The need for blood-borne infectious disease testing is highlighted by I-Track Phase 3 data showing that 79% of

HIV-positive participants were aware of their HIV-positive status and 85% of HIV-negative participants had tested for HIV in the past two years (PHAC, 2014). Since needle and syringe programs (NSPs) are often the only sources of preventive care for people who use drugs, it is important for these programs to provide primary care services that include testing and vaccination.

Indeed, the World Health Organization (WHO) has recognized the importance of testing and recommends that NSPs offer blood-borne infectious disease and sexually transmitted infection (STI) testing along with counselling and wound care, and be closely affiliated with other health programs (2007). The Saskatchewan Board of Health has further recommended that all clients who access NSPs should be tested for HIV and HCV, and proposes that test status be a key evaluation indicator of NSPs (Thompson, 2008). They also recommend that clients are retested every 12 months to ensure that every individual accessing NSPs is aware of their HIV and HCV serostatus. (For guidance on STI testing, please refer to the Canadian Guidelines on Sexually Transmitted Infections available from the Public Health Agency of Canada: www.phac-aspc.gc.ca/std-mts/sti-its/index-eng.php.)

Prevalence of HIV, HCV, HBV and TB

In 2008, 16.9% of Canadians living with HIV acquired the virus through injection drug use (PHAC, 2010). Modelling of new infections from all causes in 2011 estimated 3,175 new cases (range 2,250-4,100); 13.7% of these infections were

attributed to injection drug use (PHAC, 2012). An estimated 2,890 people who inject drugs in Canada are currently unaware of their HIV status (PHAC, 2012). Prevalence of HIV reported among people who smoke crack cocaine varies from 19% in Vancouver to 6% in Toronto and 10.6% in Ottawa (Bayoumi et al., 2012; Leonard, 2010; Shannon et al., 2008). In Vancouver, the prevalence of HIV among people who inject drugs and smoke crack cocaine is estimated to be 31% (Shannon et al., 2008).

Viral hepatitis continues to be of concern among people who use drugs in Canada. Between 2004 and 2008, 63% of acute HCV infections in Canada were attributed to injection drug use and 9% to drug snorting (PHAC, 2009). Results from the I-Track (2010-2012) survey indicate that 68% of 2,575 participants were seropositive for HCV, and 9.5% were co-infected with HIV (PHAC, 2014). It has been estimated that in Canada between 2006 and 2026, 137,000 people who inject drugs will eventually develop HCV-related complications (Werb et al., 2011). Between 2005 and 2010, 12.2% of acute HBV infections in Canada were attributed to injection drug use and 6.9% were due to non-injection drug use (i.e., snorting; PHAC, 2011). The actual number of infections may be higher since risk behaviours were not reported for 34.5% of the total cases (PHAC, 2011).

There are few studies of TB among people who use drugs in Canada. In a cross-sectional study from Toronto of 155 people who inject drugs, the prevalence of a positive tuberculin skin test was 31% (95% CI 23.8-38.9%; Rusen et al., 1999). Much of the evidence to support TB testing is from the US and focuses on people who smoke crack cocaine. A review of TB outbreak investigations in the US noted that transmission of TB is generally perpetuated through impaired immunity linked to crack cocaine use, prolonged periods where the individual has an active TB infection (instead of a latent infection), delays in seeking medical care, poverty, unstable housing, overcrowding, and drug equipment sharing in poorly ventilated spaces such as “crack houses” (Mitruka et al., 2011). Individuals who smoke crack cocaine are also more likely to have a sputum test positive for TB than people who do not use drugs (Story et al., 2008).

Co-infection with one or more of the pathogens discussed above can complicate treatment and increase the risk of mortality. It is estimated that between 1.6% and 5.8% of people living with HIV in Canada have active TB (Phypers, 2007). In a review of the HIV status of TB patients across the US from 1993 to 2005, the Centers for Disease Control and Prevention (CDC) reported that 35% of the people who inject drugs were co-infected; and 27% of the people who use

drugs through other means (i.e., snorting or smoking) were co-infected as well (2007). A Canadian study of 275 Edmonton-area people who inject drugs found that HIV prevalence was 23.9%, HCV was 66.1%, and HIV/HCV co-infection was 22.8% (Plitt et al., 2010). Eighty-four percent of the participants also reported non-injection crack cocaine use in the six months prior to this study (Plitt et al., 2010).

Testing rates

HIV testing and counselling programs are core components of many harm reduction programs across Canada and the US. Data from an Ontario survey in 2008 of 32 core NSP programs found that 96.9% offered HIV, HCV, and HBV testing (Unpublished data, 2008). In the US, most NSPs offer clinical services, including counselling and/or testing for HIV (87%), HCV (65%), other STIs (55%), and TB (31%; Centers for Disease Control and Prevention, 2010).

A national survey conducted in 2011, found that approximately 50% of Canadians had ever been tested for HIV (Calzavara et al., 2012). This proportion is significantly lower than the testing rates reported for people who inject drugs in Canada. Over 90% of Phase 1 I-Track participants in Toronto, Edmonton, and Quebec had ever been tested for HIV (PHAC, 2006). By the end of 2011, an estimated 85.5% of the people who inject drugs in Canada had been tested for HIV (Government of Canada, 2012).

Testing rates among people who inject drugs in the US are similar to those in Canada. A large survey of HIV testing in five US urban centres (Oakland, California; Chicago, Illinois; Hartford and New Haven, Connecticut; Springfield, Massachusetts) found that 93% of 1,543 people who inject drugs reported that they had been tested for HIV (Heimer et al., 2007). The mean, median, and modes of times tested per individual in this survey were 4.9, 3, and 2, respectively; and clients who attended NSPs were significantly more likely to have been tested than non-clients (OR 2.22, CI 1.26-3.89). A review of HCV counselling and testing in Texas from 2000 to 2005 found that 42.3% of all HCV tests were for people who reported injecting drugs and that injecting drugs was associated with 79.3% of all anti-HCV antibody positive results (Heseltine & McFarlane, 2007). Counselling and testing services (including HIV testing) were delivered across a number of sites including outreach settings; 26.2% and 23.6% of the tests occurred at HIV test sites and during outreach respectively. Correctional facilities, drug treatment facilities, and HIV testing and outreach sites accounted for 92% of all positive tests in this study.

Currently, there is not much data available on the frequency of HCV retesting for people who use drugs and have ongoing infection risks. This is of particular importance in the case of people who inject drugs and have been successfully treated for HCV infection. While the risk of reinfection has been found to be low (Grebely et al., 2010), the potential health consequences of further degradation of the liver and associated costs of treatment remain very high.

Barriers to testing

The bulk of the literature currently available that explores barriers to testing, counselling, and receipt of results is devoted to HIV among people who do not use drugs. The factors identified below need to be considered relevant to people who use drugs. The synopsis presented may also be applicable to HCV, HBV, and TB; however, this area of harm reduction programming remains understudied.

Barriers to testing that have been consistently identified in the literature generally fall into three major categories.

Individual factors that act as barriers to testing include:

- Fear of testing (Bucharski et al., 2006; Deblonde et al., 2010; De Wit & Adam, 2008; Kaai et al., 2012; Schwarcz et al., 2011; Spielberg et al., 2003; Wertheimer, 2011; Wurcel et al., 2005)
- Fear of being stigmatized after testing positive (Bucharski et al., 2006; Kaai et al., 2012)
- Perceived lack of anonymity of testing process (Bucharski et al., 2006; Spielberg et al., 2003; Wertheimer, 2011)
- Low level of knowledge about disease, associated risk behaviours, testing procedures and interpretation of test results (Bucharski et al., 2006; Kaai et al., 2012; Lally et al., 2008; Schwarcz et al., 2011)
- Drug use prioritization and perception that drug use would interfere with treatment (Lally et al., 2008)
- Perceptions of maltreatment by healthcare providers due to drug use (Lally et al., 2008)
- Lack of transportation to get tested and receive results (Lally et al., 2008)
- Perceived cost of testing (Lally et al., 2008; Spielberg et al., 2003)
- Low self-perceived risk (Deblonde et al., 2010; Kaai et al., 2012; Lally et al., 2008)
- Depressive symptoms (Lally et al., 2008)
- Fear of venipuncture (Spielberg et al., 2003)

- Dislike of pre-test counselling (Spielberg et al., 2003)
- Dislike of medical exams (Brassard, 2004; Rusen et al., 1999)

Service provider factors that act as a barrier to providing testing include:

- Reluctance to assess need for testing (e.g., high-risk behaviours; Deblonde et al., 2010; Lally et al., 2008)
- Lack of rapport between service provider and client (Kaai et al., 2012)
- Length of time needed to provide counselling and testing services (Stopka et al., 2007)
- Feelings of emotional distress from delivering positive results (Stopka et al., 2007)

Agency/institutional level factors that act as barriers to the delivery of testing services include:

- Limited financial resources to provide comprehensive testing services (Deblonde, 2012)
- Lack of anonymous testing (Deblonde, 2012; Kaai, 2012)
- No inclusion of other healthcare services along with testing (Kaai et al., 2012)
- Inappropriate or inaccessible site choices (Kaai et al., 2012; Thornton et al., 2012)
- Lack of culturally appropriate services (Bucharski et al., 2006; Kaai et al., 2012)
- Wait times for test results (Spielberg et al., 2003)
- Inability to ensure simultaneous receipt of results if multiple tests are conducted (Stopka et al., 2007)

Interventions to increase testing and receipt of results

Evaluations of different interventions to increase testing are limited; however, they demonstrate that the uptake of testing is influenced by a number of factors. In five health jurisdictions in California, Stopka et al. (2007) tested the impact of combining HIV and HCV testing and counselling versus HIV testing and counselling only on testing rates among people who inject drugs (n=2950). Among people who inject drugs, HIV counselling and testing rates were significantly higher when HIV and HCV testing and counselling were offered at the same time versus when only HIV testing and counselling were offered (27.1% versus 8.4%, $p<0.05$). As well, fewer clients returned for their test results when offered only HIV testing (54.3%) than when offered HIV and HCV testing (71.8%; $p<0.05$; Stopka et al., 2007).

The type of test conducted can also influence uptake of testing and receipt of results. A randomized control study conducted at an NSP and two bathhouses compared testing uptake associated with four types: a standard test (requiring venipuncture) with counselling; rapid test with counselling; oral fluid test with counselling; and standard test with choice of written pre-test materials or counselling (Spielberg et al., 2005). Among the 17,010 clients offered testing, 7,014 (41%) were eligible and 761 were tested (324 at the NSP and 437 at the bathhouses). Results showed that more clients at the NSP accepted testing (odds ratio [OR] = 2.3; $P < 0.001$) and received results (OR = 2.6; $P < 0.001$) on days when the oral fluid test was offered compared with the traditional test (Spielberg et al., 2005). Results from the bathhouse also showed that more clients accepted oral fluid testing (OR = 1.6; $P < 0.001$) than the other testing methods, but more clients overall received results on days when the rapid test was offered (OR = 1.9; $P = 0.01$; Spielberg et al., 2005). Results from a large meta-analysis of the effectiveness of different HIV counselling and testing methods to increase knowledge of HIV status showed rapid testing to be the most effective (RR, 1.38; 1.16-2.22) and more likely to lead to receipt of HIV serology results, particularly in context with low rates of return for results of serology (Hutchinson, 2006).

Other factors found to influence uptake of testing include geographic proximity and financial incentives. In St. Louis, Missouri, Striley et al. (2010) found that people who lived in zip codes with an HIV testing site were 6.1 times (95% CI, 3.10-13.03) more likely to have ever been tested than those who lived in zip codes without a testing site. Financial incentives have also been identified as an effective means to encourage individuals to get tested or to return for their results (Lorvick et al., 1999; McCoy et al., 2013). In a cross-sectional study of TB testing among people who inject drugs in Toronto, 92.8% (155) of 167 individuals returned for reading of the skin test (i.e., Mantoux test). Rusen et al. (1999) suggested that the high rates of return may have been due to established relationships with the NSP and also the financial incentives offered by the researchers.

Finally, a systematic review of HIV testing in community settings has revealed that client uptake of testing is influenced by test type (e.g., rapid versus conventional blood test involving venipuncture), availability of anonymous testing, confidentiality, and testing costs (Thornton et al., 2012). Appropriate choice of geographical sites to increase access and prompt referrals to medical care upon positive diagnosis can also reduce barriers to testing (Thornton et al., 2012).

Receipt of results is also an important consideration of all NSP programs. In 2003, the CDC launched the Advancing HIV Prevention initiative across seven cities (Boston, Massachusetts; Chicago, Illinois; Detroit, Michigan; Kansas City, Missouri; Los Angeles, California; San Francisco, California; and Washington, D.C.). Between 2004 and 2006, 23,900 individuals were tested and 6% were people who inject drugs. Syringe exchange sites were among the sites identified for the rapid testing intervention. Eighty-six percent (286) of the individuals who received a preliminary positive rapid test received a confirmatory test and 93% (267) of these individuals were confirmed to have HIV infection. Seventy-five percent (200) of these individuals received their final test results. The most common reason provided by sites for clients not receiving their confirmatory results was that they could not be located. Eighty-six percent of the HIV-positive individuals accepted referrals to medical care for HIV (Centers for Disease Control and Prevention, 2007). The project demonstrated that rapid testing targeted at specific high-risk groups can identify individuals unaware of their HIV status.

HIV testing is likelier when individuals perceive that they are at risk and perceive more benefits; however, fear of testing positive and subsequently experiencing discrimination and rejection remain significant barriers (De Wit & Adam, 2008). To increase early diagnosis, service providers should obtain routine histories of risk behaviours and previous testing, make more recommendations to clients to get tested, and include testing in routine healthcare (Schwarcz et al., 2011). Key messages to service users should communicate that:

- Effective, safe, and low-cost or free medical care is available in case of a positive diagnosis;
- Early HIV diagnosis improves health outcomes;
- HIV can be transmitted through unprotected sexual contact, although viral load suppression may significantly lower the risk of transmission;
- Testing after engaging in risky behaviours should be encouraged;
- Serostatus information will never be divulged; and
- It is important to encourage peers to get tested (Schwarcz et al., 2011).

The Canadian Association for the Study of the Liver Consensus Guidelines for Management of Chronic HBV state that all individuals who use recreational intravenous drugs should be screened due to increased risks of contracting HBV (Coffin et al., 2012). To reduce the burden on clients,

Stopka et al. (2007) recommended streamlining of testing, receipt of results, and referral to treatment. It is, therefore, important for NSPs to advocate and collaborate with medical services to ensure sufficient treatment for people who use drugs.

TB rates among people who inject drugs increase significantly with age, years of drug use, HIV infection, and time spent in locations where TB is easily transmitted; these factors result in a cumulative risk that justifies continuous screening programs (WHO, 2008). Non-injecting drug users also have high rates of latent TB infection and the CDC recommends that TB screening and treatment be targeted toward all people who use drugs (American Thoracic Society/Centers for Disease Control and Prevention/Infectious Diseases Society of America, 2005).

Secondary impacts of testing within NSPs

Higher frequency of visits to NSPs has previously been associated with greater receipt of services such as testing, counselling, and vaccination (Heinzerling et al., 2006). Research demonstrates that testing may have an impact on risk behaviours, particularly sexual behaviours. Two large meta-analyses have revealed significantly reduced sexual risk behaviours after an HIV diagnosis (Marks et al., 2005; Weinhardt et al., 1999). Counselling is an essential component of testing protocols, and it has also been associated with reductions in risk behaviours. The HIV Testing Survey (HITS) was a survey conducted in the United States across several states between 1995 and 2003. Among survey participants who inject drugs (41% of 2,491 of the total number of participants), those who were tested for HIV were more likely to use knowledge received during counselling or skills-building interventions compared to those who did not get tested (8%; $p < 0.01$; Kellerman et al., 2006). People who inject drugs and had ever been tested for HIV were also more likely to have ever participated in role playing safer sex talk with a partner ($p < 0.01$) and small-group counselling sessions ($p < 0.01$; Kellerman et al., 2006). The authors of this study noted that since counselling and skills building were most often associated with HIV testing, combining all interventions consistently was a more effective strategy (Kellerman et al., 2006).

HCV testing and counselling services can also impact the knowledge and practices of those who use these services and help prevent transmission of the virus. A large study across a number of sites in the US (Baltimore, Chicago, Los Angeles, New York City, and Seattle) of people aged 15 to

30 ($n = 3,004$) who inject drugs found that knowledge of HCV sero-negative status was associated with higher scores of HIV/HCV knowledge, higher self-efficacy for safer drug injection, and getting syringes from a "safe source" (i.e., NSPs, pharmacies, and hospitals; Hagan et al., 2006).

Specific guidelines and recommended reading:

HIV

British Columbia Centre for Disease Control (2011). Communicable Disease Control Manual Chapter 5 – Sexually Transmitted Infections HIV Pre and Post Test Guidelines September 2011. Vancouver: British Columbia Centre for Disease Control. Accessed from: www.bccdc.ca/NR/rdonlyres/C0486576-7398-4630-B71C-31A0D5EAEBDC/0/STI_HIV_PrePost_Guidelines_20110923.pdf

Canadian Aboriginal AIDS Network (2012). Pre and Post HIV Test Counselling Guide HIV pre-test and post-test discussions for Aboriginal community health care professionals and representatives. Vancouver: Canadian Aboriginal AIDS Network. Accessed from: <http://caan.netfirms.com/wp-content/uploads/2012/05/get-tested-guide.pdf>

Canadian AIDS Society (2004). HIV Transmission: Guidelines for Assessing Risk. A resource for educators, counselors and healthcare providers. 5th Ed. Ottawa: Canadian AIDS Society Accessed from: [www.cdnaids.ca/home.nsf/ad7c054e653c96438525721a0050fd60/4d4cf-16b70a7247f0525732500678839/\\$FILE/HIV%20TRANSMISSION%20Guidelines%20for%20assessing%20risk.pdf](http://www.cdnaids.ca/home.nsf/ad7c054e653c96438525721a0050fd60/4d4cf-16b70a7247f0525732500678839/$FILE/HIV%20TRANSMISSION%20Guidelines%20for%20assessing%20risk.pdf)

Public Health Agency of Canada. (2012). Human Immunodeficiency Virus. HIV Screening and Testing Guide. Ottawa: Centre for Communicable Diseases and Infection Control Public Health Agency of Canada.

HCV

British Columbia Centre for Disease Control (2013). Hepatitis C virus pre - and post-test checklists. Vancouver: British Columbia Centre for Disease Control. Accessed from: www.bccdc.ca/NR/rdonlyres/03938ED2-F7F0-4247-958E-4C837D-51D4E7/0/Prepostdiscussionchecklistcolour.pdf

Ellendon, N. (2012). Hepatitis C Counseling. Best Practice Manual. New York: The Hepatitis C Harm Reduction Project Harm Reduction Coalition. Accessed from: <http://harmreduction.org/hepatitis-c/hepatitis-tools/hepatitis-c-counseling-best-practices-manual/>

HBV

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Weinbaum, C., Williams, I., Mast, E., Wang, S., Finelli, L., Wasley, N., Neitzel, S. & Ward, J. (2008) Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection. *Mortality and Morbidity Weekly Reports*, 57(RR08), 1-20.

TB

Alberta Health and Wellness (2010). Tuberculosis Prevention and Control Guidelines for Alberta June 2010. Edmonton: Government of Alberta. Accessed from: www.health.alberta.ca/documents/tb-prevention-control.pdf

Anon. Tuberculosis Control. A reference guide to the tuberculosis program in Saskatchewan. 2005. Regina: Saskatchewan Health Region. Accessed from: www.saskatoonhealthregion.ca/your_health/documents/TuberculosisControl-AReferenceGuidetotheTBPrograminSaskatchewan.pdf

New York City Department of Health and Mental Hygiene (2008). Clinical Policies and Protocols, 4th Ed. New York City: Bureau of Tuberculosis Control, New York City Department of Health and Mental Hygiene. Accessed from: www.nyc.gov/html/doh/downloads/pdf/tb/tb-protocol.pdf

Nunavut Tuberculosis Program (no date). Nunavut TB Control and Elimination Manual. Iqaluit: Government of Nunavut. Accessed from: www.hss.gov.nu.ca/PDF/Nunavut%20TB%20Manual.pdf

Public Health Agency of Canada (2007). Canadian Tuberculosis Standards 6th Ed. Ottawa: Tuberculosis Prevention and Control, Public Health Agency of Canada and the Canadian Lung Association/Canadian Thoracic Society. Accessed from: www.phac-aspc.gc.ca/tbpc-latb/pubs/tbstand07-eng.php

Public Health Network Council (2012). Guidance for Tuberculosis Prevention and Control Programs in Canada. Ottawa: Pan-Canadian Public Health Network. Accessed from: www.phn-rsp.ca/pubs/gtbpccp-oppctbc/pdf/Guidance-for-Tuberculosis-Prevention-eng.pdf

Testing services for HIV, hepatitis C, hepatitis B, and tuberculosis evidence summary

The evidence that informs this chapter and its recommendations comes from a variety of sources. Epidemiological data has contributed to an understanding of the burden of HIV, HCV, HBV, and TB among people who use drugs. Two meta-analyses and two cross-sectional studies were the main sources of evidence supporting the role of testing in changing risk behaviours. Evidence detailing barriers to testing was provided by cross-sectional and qualitative studies. Observational studies and a randomized controlled trial (RCT) provided evidence to support recommendations to increase uptake of testing and receipt of results. Finally, systematic reviews contributed to overall understanding of barriers to testing.

RCTs are considered to provide the highest calibre of evidence to support health-related interventions. However, these trials are not always feasible or ethical to conduct in populations who access NSPs. This difficulty has been recognised by leading public health experts and authorities.

Evidence related to testing in NSPs is limited but growing. As the delivery and evaluation of this important service increases, we anticipate more evidence to support NSPs in expanding their services.

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7 Vaccination services for hepatitis A and B, pneumococcal pneumonia, influenza, tetanus, and diphtheria



RECOMMENDED BEST PRACTICE POLICIES to increase clients' knowledge of vaccine-preventable diseases (i.e., hepatitis A and B, pneumococcal pneumonia, influenza, tetanus, and diphtheria) and rates of vaccination, and to decrease risk of infection:

- Ensure access (on site or through referral) to a variety of vaccinations according to municipal, provincial, and federal recommendations
- Educate clients about the benefits of vaccination
- Establish and maintain relationships with a variety of healthcare providers and agencies, in particular those with experience working with people who use drugs
- Conduct vaccination campaigns outside of needle and syringe program (NSP) settings in order to access harder-to-reach people who use drugs
- Evaluate and publish any vaccination initiatives undertaken

Vaccination for people who use drugs

People who use drugs can be susceptible to a number of vaccine-preventable infections, such as hepatitis A (HAV), hepatitis B (HBV), and invasive pneumococcal disease. Pre-existing medical conditions, poverty, unstable housing, and social marginalization can further compound the risk of infection and mortality among this population. Recognition of these factors has led Health Canada's National Advisory Committee on Immunization and the Centers for Disease Control and Prevention (CDC) in the United States to recommend that people who use drugs be vaccinated against HAV and HBV (CDC, 2012; PHAC, 2012a, 2012b). The Canadian National Advisory Committee on Immunization has also prioritized people who use drugs as a population that should be considered for the pneumococcal vaccine (PHAC, 2008) and identifies this population as requiring general immunization counselling for a number of diseases (PHAC, 2013). Administering HAV and HBV vaccinations may also reduce the risk of further liver damage in individuals who inject drugs and are hepatitis C (HCV) positive.

Vaccination is frequently delivered as a component of primary care, and providers in these settings are ideally situated to provide preventative care over the lifespan. However, many NSP clients lack relationships with primary care providers or prefer not to engage with healthcare providers on a regular basis. People who use drugs may also not feel comfortable disclosing their drug use to their primary care providers. Therefore, provision of services beyond safer drug use supplies from NSPs may help to further improve clients' health.

Prevention services such as provision of vaccination require the expertise of regulated healthcare providers along with practices to ensure safe delivery, storage, and administration of vaccines. For NSPs that cannot provide clinical services on site, referrals can be made to low-barrier medical services and local public health units. The following is a synthesis of literature related to vaccination services at NSPs. Since there are a number of vaccine-preventable diseases that are not directly associated with drug use (e.g., human papillomavirus or HPV), please refer to the appropriate provincial and national documents for guidance. These documents should also form the basis for development of vaccination services at NSPs.

HAV and HBV

HAV affects the liver and symptoms of infection include nausea, vomiting, diarrhea, fever, and abdominal pain. The infection is generally self-limiting and can resolve without long-term liver problems. The fecal-oral route is the most common route of transmission of HAV, but people who use drugs are also at increased risk for contracting HAV through poor living conditions, drugs contaminated with fecal matter, water contaminated with HAV, and/or sharing oral or nasal drug consumption equipment (PHAC, 2012a). Villano et al. (1997) found that crowded housing and poor hygiene contributed more to the risk of HAV transmission than drug consumption practices. Transmission is possible when hands contaminated with HAV touch needles and/or come into contact with water used to mix drugs or rinse drug use equipment. The Canadian Immunization Guide recommends

that people with pre-existing liver disease (e.g., chronic HBV, HCV, and liver cirrhosis) and men who have sex with men be vaccinated against HAV (PHAC, 2012a). A review of HAV outbreaks from 1994 through 2004 found that there were 10 such outbreaks among people who inject drugs across the United States; there were 256 total outbreaks in that period (i.e., outbreaks in the general population; Craig et al., 2007).

HBV is also a virus that affects the liver. The virus is transmitted through exposure to blood, semen, and vaginal fluids. Acute illness causes inflammation of the liver, jaundice, nausea, and vomiting. Chronic infection eventually leads to cirrhosis and may progress to liver cancer. In Canada, most HBV infections occur in people who are over 24 years of age who have not been vaccinated and are acquired through sexual activity and sharing of drug injection equipment (PHAC, 2012b). Vaccination against HBV as early as possible in a person's drug use career is advised. In a study of 716 people who were new to injecting drugs (one year or less of injecting) in Baltimore, it was found that 65.7% had serological evidence of exposure to HBV within the first year of injecting (Garfein et al., 1996).

Early vaccination against HBV is a cost-effective strategy for preventing HBV-related medical costs. Hu et al. (2008) studied 1,964 people who inject drugs in Chicago, Illinois and Hartford and Bridgeport, Connecticut recruited through local NSPs. The authors found that when program costs were balanced against future HBV associated medical costs and quality adjusted life years, HBV vaccination for people who inject drugs was cost effective. They concluded that coupling of testing and vaccination was necessary for effective prevention through NSPs (Hu et al., 2008).

Studies show high rates of previous HAV and/or HBV infection and low rates of vaccination among people who use drugs. Of the 4,035 participants in the Enhanced Surveillance of Canadian Street Youth study, only 64 (1.6%) were positive for both anti-HBV and anti-HAV antibodies (indicative of previous vaccination; Huang et al., 2010). The authors concluded that street youth were likely susceptible to infection because of insecure housing and substance use (Huang et al., 2010). A five-city US cross-sectional study of people who inject drugs (n=3,181; Baltimore, Seattle, Los Angeles, New York and Chicago), found anti-HAV and anti-HBV prevalence of 19% and 23%, respectively (Campbell et al., 2007). Another American study conducted in Alaska examining the association between drugs injected (cocaine and its derivatives, morphine, and amphetamines) and HAV, found that

the overall prevalence of previous HAV exposure in the sample was only 33% (161/493; Wells et al., 2006).

Homelessness and poverty have been associated with HAV outbreaks in a number of countries. In a study of 1,138 homeless or marginally housed individuals in San Francisco, 52% had previously been exposed to HAV; this was 58% higher than the expected prevalence based on general population rates at the time (Hennessy et al., 2009). Previous exposure to HAV in this study was found to be significantly associated with cumulative years of homelessness (OR 1.7, 95% CI 1.2, 2.4) and ever injecting drugs versus never using drugs (OR 2.0, 95% CI 1.2, 3.2; Hennessy et al., 2009). A study comparing the correlates of previous HBV infection between people who inject drugs and non-injection users in Baltimore found that significantly more people who had ever injected displayed previous HBV infection (37% versus 19% for non-injection users, p. 0.001; Kuo et al., 2004).

Young people who use drugs remain at high risk for HBV infection despite vaccination programs for children in Canada and the US. Data of 4,035 youth from the Enhanced Surveillance of Canadian Street Youth study found that only 51.7% of the youth during the study period displayed vaccine-induced immunity against HBV; the prevalence of immunity against HBV in the general adolescent population at the time of the study was 90% (Huang et al., 2010). A San Francisco study of 831 young people (less than 30 years of age) who inject drugs revealed that 21% had a current or past HBV infection and 22% had evidence of vaccination, but 56% had no evidence of exposure to HBV, indicating susceptibility to infection (Lum et al., 2008). Amesty et al. (2008) recruited 1,211 people who used heroin, crack cocaine, and cocaine from Harlem and the Bronx, New York, to examine correlates of HBV vaccination. Among the 399 participants who were less than 25 years old, 30% had evidence of previous vaccination against HBV, 49% were susceptible to HBV, and 20% had serological evidence of previous infection (Amesty et al., 2008). For participants aged 25 or older, only 10.6% demonstrated previous vaccination, 59.2% were susceptible to HBV, and 30.2% showed evidence of previous infection.

Finally, results from a study conducted in Baltimore (Kuo et al., 2004) showed the prevalence of HBV vaccination based on serological testing was 11%, with no difference noted between the two groups (people who inject drugs versus non-injection users), and 89% of all participants in this study (287 out of 324) also showed no evidence of past vaccination. In another study containing 402 non-injecting

women who use drugs from New York City, only 16.7% had previously been vaccinated against HBV, 31.1% were previously infected, and 52.2% remained susceptible to the virus (Koblin et al., 2007). These studies demonstrate the continuing need for HAV and HBV vaccine promotion and uptake for people who use drugs.

Pneumococcal pneumonia

Pneumococcal pneumonia (invasive pneumococcal disease or IPD) is an illness of the upper respiratory tract caused by a number of strains of the *Streptococcus pneumoniae* bacteria. It is spread through contact with people who are carrying the bacteria in their throats (with or without illness) and also droplets (mucous or phlegm) from the nose or mouth of an infected person. There have been a number of outbreaks of IPD linked to drug use in Canadian cities and these outbreaks have highlighted factors associated with serious illness among people who use drugs.

In an outbreak that occurred in Vancouver between 2006 and 2007, a single variant of the bacterium was responsible for 137 out of 175 cases (78%); use of crack cocaine was found to be the major independent risk factor for developing serious disease (OR 12.4; 95% CI 2.22-69.5; Romney et al., 2008). A vaccination campaign was credited with controlling the outbreak. The authors of this report recommended pneumococcal vaccination for people who use drugs including crack cocaine (Romney et al., 2008). In another report of 69 cases of pneumococcal disease among homeless individuals (42 out of the 69 also reported injection drug use) in Toronto between 2002 and 2006, the incidence was 273 infections per 100,000 persons per year compared to 9 per 100,000 persons per year for the general population (Plevneshi et al., 2009). Laboratory testing also revealed that 48% of the pneumococcal strains were included in the 13-valent conjugate vaccine and 83% were targeted by the 23-valent polysaccharide vaccine (Plevneshi et al., 2009).

Between 2005 and 2007, there were 207 cases of IPD (162 cases of ST5 strain IPD and 45 cases of ST8 strain IPD) in the Calgary area and laboratory testing revealed little genetic variation in the bacteria isolated (an indicator of a common origin; Vanderkooi et al., 2011). Individuals infected with ST5 (a bacterial variant) were more likely to be of middle age (OR 2.6), homeless (OR 4.4), smoke drugs such as crack cocaine (OR 4.8), and have asthma (OR 2.6; Vanderkooi et al., 2011). IPD was significantly associated with homelessness despite only 9% (55/596) of the sample being homeless. This study also contained data on nasopharyngeal swabs taken

at a Calgary drop-in centre (n=79); 14 people were positive for *Streptococcus pneumoniae* and six (43%) of these individuals smoked crack cocaine (five of whom also reported sharing pipes; Vanderkooi et al., 2011). These outbreaks highlight the need for promotion of pneumococcal vaccines for people who use drugs.

Influenza

Influenza is a viral disease and symptoms can include fever, sore throat, and muscle weakness. The viruses are spread between people through droplets from sneezing or coughing. Yearly vaccination is recommended to reduce the chances of illness due to influenza. The vaccination formulations vary yearly based on actual and projected viral strains circulating among the general population. The influenza vaccine is recommended for all Canadian adults, particularly those with compromised immune systems or chronic diseases (PHAC, 2013).

Tetanus and diphtheria

Tetanus is a potentially fatal, vaccine-preventable disease caused by *Clostridium tetani* that gains entry into the body through wounds. The bacterium's spores can survive in soil and have been reported as a contaminant in heroin leading to tetanus among people who inject drugs (Hahné et al., 2004; Vugia et al., 2004).

Diphtheria is another vaccine-preventable disease that has implications for people who use drugs. The bacterium can lead to chronic ulcers when introduced into wounds. A review of cutaneous (skin) diphtheria cases in the Downtown Eastside of Vancouver between 1998 and 2007 concluded that the cases were associated with injection drug use and poverty; the review highlighted the risk of serious disease associated with the infection (Lowe et al., 2011).

Barriers to vaccination

Much of the literature reporting barriers to vaccination for people who use drugs is devoted to HBV. Despite the lack of extensive research or evaluation of vaccination services for people who use drugs, the existing literature can be useful in the design of vaccination services for people who use drugs. These barriers fall into three broad categories:

Individual factors that act as barriers to vaccination include:

- Lack of awareness about the need for vaccination (PHAC, 2013)
- Lack of knowledge about vaccine-preventable disease (Koblin et al., 2007; Lally et al., 2008)
- Drug use prioritization (Lally et al., 2008)
- Membership in a stigmatized or marginalized group such as being a person who uses drugs (Lally et al., 2008)
- Concern that disclosure of drug use will lead to judgemental attitudes from healthcare providers (Lally et al., 2008)
- Depressive symptoms (Lally et al., 2008)
- Fear of needles and/or syringes (Tompkins et al., 2007)
- Poverty and homelessness (Quaglio et al., 2006)
- Not having a regular primary care provider (Stancliff et al., 2000)

Service provider factors that act as barriers to vaccination include:

- Lack of healthcare providers trained to provide vaccination to people who use drugs (Winstock et al., 2006)
- Healthcare providers not recommending vaccines to adults (PHAC, 2013)
- Lack of understanding by healthcare providers about the benefits of preventing disease with vaccination (PHAC, 2013)

Agency/institutional level factors that act as barriers to vaccination include:

- Lack of public health infrastructure to provide vaccinations for people who use drugs (Quaglio et al., 2006)
- Lack of targeted vaccination education campaigns (Quaglio et al., 2006)
- Lack of accessible healthcare services for people who use drugs (Winstock et al., 2006)
- Lack of publicly funded vaccine programs and/or reimbursement of healthcare providers for vaccination services (PHAC, 2013)

Improving coverage and rates of vaccination for people who use drugs

Researchers have explored a number of strategies to increase uptake and adherence to vaccine-schedule completion and

they include: financial incentives; convenient timing, locations, and outreach; offering a variety of vaccinations concurrently; education and awareness; and policy changes.

Effective motivational incentives for NSP clients have been the focus of many studies because of the need for client follow-up and vaccine-series completion. Stitzer et al. (2010) sought to examine the effects of prize-based incentives on retention and adherence for 26 people who use cocaine from Baltimore (this study did not report how the cocaine was consumed, i.e., snorting, injecting, or smoking). In this study, participants met the researchers for 24 weeks and received seven injections containing either the HBV vaccine or a placebo and were compensated \$10 per visit. Participants assigned to the incentive program received additional payments on an escalating scale for attendance at weekly monitoring and vaccination visits with maximum possible earnings of \$751 (Stitzer et al., 2010). The researchers found that group attendance changed after week eight of the study with better attendance in the incentive versus control group ($p = 0.035$); 77% of the incentive group versus 46% of the control group completed all of their injections (Stitzer et al., 2010).

Combining monetary incentives and convenient timing of vaccination may also be a useful strategy to increase uptake of vaccination among people who use drugs. Campbell et al. (2007) recruited 3,181 participants between the ages of 18 to 30 years old from community settings across 5 US cities (Baltimore, Seattle, Los Angeles, New York, and Chicago). In this quasi-experimental study, vaccinations were offered prior to results of serological testing across four of the sites, and on-site availability and incentives varied across the sites (Campbell et al., 2007). Participation was the greatest when the vaccine was administered immediately at the time of visit, and participation was very low when vaccination was offered after receiving results of blood tests (Campbell et al., 2007). Data analysis also revealed that participants who were offered the vaccination immediately after the interview were significantly more likely to receive at least one dose of vaccine (AOR 48.6, 95% CI 35.7, 66.0; Campbell et al., 2007). The authors concluded that monetary incentives may have played a role in increased participation when immediate vaccination was not available – participants who were interviewed off site with an incentive were significantly more likely to receive at least one dose of vaccine than participants who could not receive the vaccine immediately after the interview (AOR 11.2, CI 8.1, 15.6; Campbell et al., 2007).

Accessible and convenient locations may also increase the uptake of vaccination. Des Jarlais et al. (2001) concluded that modest financial incentives and convenient locations can increase completion of vaccine series among people who inject drugs when compared to referrals to healthcare providers. Other research supports the role of convenience and bundling of services. For example, Altice et al. (2005) found that pairing screening/testing and vaccination into a mobile health clinic accompanying an NSP van demonstrated significant success in leading people who inject drugs to seek healthcare services.

In 1999, a comprehensive vaccination campaign was launched for residents of the Downtown Eastside in Vancouver (Weatherill et al., 2004). In the fall, public health nurses and volunteers offered influenza and pneumococcal vaccinations in a variety of community settings to all individuals in the area. HAV and HBV vaccinations were subsequently offered over two months in early 2000; all four vaccines were offered again in the fall of 2000. The campaign continued until June 2002 on a seasonal basis. The initial five-week influenza and pneumococcal vaccination campaign yielded 8,723 vaccinations and 79% of participants received both vaccinations. In the three months after the initial campaign, there was a reduction in visits for pneumonia to emergency departments. The five-week HAV and HBV vaccination yielded 3,542 total vaccinations; 58% of individuals received both vaccinations. Authors of the report on this campaign noted that uptake of influenza vaccine was reduced when offered in combination with the three other vaccines; therefore, it was offered as a standalone in following years (Weatherill et al., 2004). This study demonstrated that vaccination can be successfully delivered in settings outside of NSPs and programs should consider the role that outreach can play in improving the health of people who use drugs.

Increasing education and awareness may increase uptake of vaccination. Koblin et al. (2007) recruited 402 HIV-negative women who did not inject drugs into a study that aimed to assess level of knowledge, previous HBV infection and vaccination, motivators and barriers to accepting vaccination, and uptake of the HBV vaccine. Knowledge of HBV (infection, transmission, and prevention) was low with a mean of 6.1 out of 12 on true or false knowledge questions. Of the 210 HBV-susceptible women, 69% (145/210) began the HBV vaccine series immediately after educational counselling was delivered (Koblin et al., 2007). In another study where attendees of an NSP were educated about vaccines and immediately offered the influenza and pneumococcal vaccines, uptake of each vaccine was 86% and 70%, respectively

($p=0.0001$; Standcliff et al., 2000). This study also found that many NSP clients with chronic medical conditions for whom vaccination is recommended did not have a regular source of medical care, a finding that highlights the role that NSPs can play in connecting clients to ongoing medical services.

Offering different types of vaccines concurrently can also increase uptake. In a national US study of adults aged 18 years and older who were at high risk for HBV infection, more than 50% of high-risk adults were not vaccinated against HBV (for a variety of reasons) and more than 50% also had missed an opportunity for vaccination ($n=15,432$; Ladak et al., 2012). High-risk adults in this study included people who had ever injected drugs, ever traded sex for money or drugs, and had tested positive for HIV. Two other important findings from this study were: those vaccinated against pneumonia (pneumococcal vaccine) and influenza had higher odds of also being vaccinated against HBV than people who had not received the pneumococcal and influenza vaccines (OR 2.27 and 1.67, respectively); and those tested for HIV at a counselling and testing site also had higher odds of being vaccinated against HBV compared to those who had not been tested (OR 1.78 and 1.73, respectively; Ladak et al., 2012). Availability of a number of vaccines concurrently may therefore be of greater utility in tackling vaccine-preventable diseases.

A study of 760 inner-city individuals including people who inject drugs from East Harlem and the Bronx in New York found that receiving “a hepatitis vaccine” was significantly associated with ever receiving the influenza vaccine ($p=0.0001$; Bryant et al., 2006). An analysis of data from the US 2009 National Health Interview Survey – assessing self-reported HBV vaccine uptake (greater or equal to one dose), series completion, and independent predictors of vaccination among high-risk adults – found a higher likelihood of HBV vaccination being associated with the following: two or more physician contacts in the past year, ever being tested for HIV, receiving the influenza vaccine in the past year, and ever receiving the HAV vaccination (Lu et al., 2011). High-risk adults in this study included men who have sex with men, people who inject drugs, having had a sexually transmitted infection (STI) in the prior 5 years, ever traded sex for money or drugs, being HIV positive, and having sex with any persons with these risk factors (Lu et al., 2011).

Policy changes also have an important role in reducing the prevalence of vaccine-preventable diseases. For example, policies related to HAV vaccination in BC were expanded in 1998 to include people who inject drugs, and people with

HCV or chronic HBV. Analysis of BC Health Authority data revealed that between 1998 and 2004, rates of HAV decreased steadily among people who inject drugs, to the extent that HAV related to travelling represented all of the cases reported in 2004 (i.e., no cases were reported among people who inject; Pollock et al., 2006).

While proactive campaigns and policy changes are necessary to increase vaccine coverage on a population level, service providers have many opportunities to promote vaccinations when interacting with individual service users. PHAC (2013) has outlined a few key opportunities to improve vaccination rates and they include:

- When a person is diagnosed with a chronic disease
- When a person has evidence of behaviours associated with a higher risk, such as illicit drug use or STIs
- During new client encounters

The strategies presented here offer different approaches toward maximizing prevention of diseases for which vaccines are readily available in Canada. Blending or combining these strategies may help to achieve optimal levels of vaccination.

For more in-depth guidance regarding immunization and schedules please refer to the Public Health Agency of Canada's list of provincial and territorial websites devoted to immunization at: www.phac-aspc.gc.ca/im/is-cv/index-eng.php

Vaccination services for hepatitis A and B, pneumococcal pneumonia, influenza, tetanus, and diphtheria evidence summary

The evidence and recommendations presented in this chapter have been compiled from a variety of sources. Epidemiological data has contributed to most of our understanding of the vaccine-preventable diseases among people who use drugs.

Cross-sectional studies were the main sources of evidence supporting the role of vaccination. Other sources included quasi-experimental studies, and systematic reviews which contributed to overall understanding of barriers to vaccination.

Evidence related to vaccination in NSPs is limited but growing. As the delivery and evaluation of this important service increases, we anticipate more evidence to support NSPs in expanding their services to include provision of vaccination to prevent serious vaccine-preventable diseases.

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8 HIV and/or hepatitis C treatment referrals



RECOMMENDED BEST PRACTICE POLICIES to increase access to medical treatment for human immunodeficiency virus (HIV) and/or hepatitis C (HCV):

- Educate clients about HIV and/or HCV treatment options and where to seek additional information about risks, benefits, and side effects
- Refer clients who test positive or are known to be HIV- and/or HCV-positive to HIV and/or HCV treatment providers in the community
- Establish and maintain relationships, and develop clear referral protocols with HIV and/or HCV treatment providers, in particular those with experience working with people who use drugs
- Encourage peer workers with lived experience of HIV and/or HCV to participate in existing peer support/navigation programs or assist in developing and delivering peer support/navigation activities for clients
- Evaluate and publish any HIV and/or HCV treatment referral initiatives undertaken

Providing referrals to HIV and/or HCV treatment from needle and syringe programs (NSPs)

According to the World Health Organization (2013), NSPs can play a crucial role in supporting the prevention, treatment, and other healthcare needs of people who use drugs and are living with HIV and/or HCV. In particular, NSP staff can help to identify and refer clients to HIV and HCV treatment providers.

People who use drugs and access NSP services face numerous barriers to accessing healthcare and other social services, and have identified a number of service needs. In a US study exploring the needs of 251 people who use drugs and access NSPs, medical services, among others, emerged as an unmet service need (Stein & Friedmann, 2002). Since many people who use drugs do not regularly access health and other social services, NSPs are often the only contact point for this population and thus are an important bridge to HIV and HCV treatment providers and other health and social services (Porter et al., 2002). Many NSPs provide HIV and/or HCV prevention, testing, and counselling services (Des Jarlais et al., 2009); however, little evidence exists to suggest how referrals to HIV and HCV treatment providers are managed at NSPs.

We do know that people living with HIV who use drugs often have difficulty accessing HIV and/or HCV treatment and other types of healthcare services (Harris & Rhodes, 2013; Krusi et al., 2010; Mravcik et al., 2013; Sohler et al., 2007; Wood et al., 2008). As a result, in this chapter we focus on

literature that examines facilitators and barriers to uptake of HIV and HCV treatment to assist NSPs and other harm reduction programs to refer clients to services and reduce barriers to HIV and/or HCV treatment.

For the purposes of this document, the term “referral” corresponds to the action of connecting clients to healthcare providers and services. Referral from community-based programs can take multiple forms, including informal provision of information to clients about where to access services, formal referral to a specialized service by a healthcare provider or social worker and finally, an integrated approach that connects clients to on-site services. Social and health service settings vary greatly and services such as HIV treatment may require formal referrals to specific specialist HIV care providers or informal referrals to community health centres that may have specialists on staff. While referral to HIV or HCV treatment is often thought of as a formal process, community health centres may be able to provide HIV and HCV treatment services without the requirement of a formal referral. Given that the mechanism for making a referral varies greatly and depends on type of service and location, our definition of referral here will be all encompassing.

People who use drugs and are co-infected with HIV and HCV face additional health issues. In a large (n=3,111) Swiss prospective cohort study exploring the effect of co-infection with HIV and HCV on progression of HIV and immunological response following ART treatment, Greub et al. (2000) found those co-infected had an increased likelihood of developing an AIDS-defining illness ($p = 0.001$), compared with

those living only with HIV (Greub et al., 2000). While studies have suggested greater likelihood of retention in HCV care and adherence to HCV treatment among those co-infected with HIV (Braitstein et al., 2006; Schackman et al., 2007) these clients carry the burden of two highly stigmatized infectious diseases and likely face unique challenges. A full review of HIV and HCV treatment access and uptake barriers among co-infected people who use drugs is beyond the scope of this review, but it is important to consider that the challenges discussed below may be compounded in people with both HIV and HCV.

Linkage to HIV specialist care and treatment

Early linkage to HIV specialist care and initiation of anti-retroviral treatment (ART) among people living with HIV who inject drugs has been recommended to improve health outcomes and reduce morbidity and mortality (WHO, 2013). ART is a combination of three or more antiretroviral drugs that act to suppress HIV (also known as combination ART or highly active ART; WHO, 2013). Importantly, the WHO has emphasized that enrollment in drug treatment is not necessary to begin ART and that continued drug use should not preclude ART initiation (WHO, 2012). Many barriers, however, prevent people who inject drugs from accessing HIV specialist care and initiating HIV treatment. People living with HIV who use drugs are less likely to receive antiretroviral therapy than other people living with HIV (Himelhoch et al., 2007; Sohler et al., 2007) and even when they do, they are more likely to be delayed in initiating treatment regimens (Ding et al., 2005). Evidence suggests that peer health navigation improves access to HIV care (Broeckeaert & Challacombe, 2014).

Data collected as part of the Canadian HIV surveillance system, I-Track (Public Health Agency of Canada [PHAC], 2013), showed that 21.7% of people who inject drugs who were HIV positive were not receiving HIV treatment. In addition, it is estimated that 24% of people who inject drugs and are living with HIV are not aware of their positive status (PHAC, 2011). This is alarming, given the availability of effective HIV treatment and the important role it plays in reducing morbidity and mortality associated with HIV infection, along with reducing the risk of further HIV transmission.

ART initiation

Initiation of ART largely depends on clients accessing HIV testing and treatment services, clinical assessments, and provider willingness to prescribe treatment. As described earlier,

many people who use drugs already face numerous barriers when accessing health services, and engaging with an HIV treatment provider to initiate ART may also be a challenge. Below are some barriers that have been identified in the scientific literature.

In a study surveying 662 Canadian and American HIV care providers (medical doctors, nurse practitioners, osteopathic doctors, registered nurses, and physician assistants) about their training and attitudes toward people who inject drugs, more than half stated they would delay HIV treatment initiation for people who were injecting daily (Westergaard et al., 2012). HIV treatment deferral was less likely among those with more experience providing HIV care (AOR = 0.84, 95% CI: 0.73 to 0.95) and whose patient-base included more than 10% of clients who inject drugs (10-25% AOR = 0.83, 95% CI: 0.52 to 1.32, and >25% AOR = 0.41, 95% CI: 0.16 to 1.03; Westergaard et al., 2012). In a US cross-sectional study of 411 physicians' training, experience, and attitudes toward HIV-infected individuals who inject drugs, concerns related to increased risk of drug resistance as well as negative attitudes toward this population were cited as reasons for reluctance to initiate ART (Ding et al., 2005).

HIV treatment is often tied to enrollment in drug treatment and has been associated with improved adherence to ART and clinical HIV outcomes (Palepu et al., 2006). Requiring people living with HIV to enroll in drug treatment in order to initiate ART, however, creates a barrier for clients unable or unwilling to start drug treatment. Following a systematic review of factors affecting initiation of ART among active drug users, there was decreased likelihood of ART initiation among participants not enrolled in drug treatment or methadone maintenance therapy programs (Malta et al., 2014). Restricted access to ART related to client unwillingness or inability to initiate drug treatment is a barrier facing people living with HIV who use drugs, and may pose an even greater barrier in places where options for drug treatment are scarce.

Interventions to improve initiation of ART

Referring clients to HIV treatment providers who can deliver appropriate advice, recommend HIV treatment options, and discuss HIV treatment-associated side effects is an important service NSPs can provide. The decision to prescribe ART and a specific treatment course is one that must be made at an individual level and in the context of a patient-provider relationship, to ensure a clinically appropriate and relevant treatment plan.

While offering preliminary information about the benefits of initiating ART and common side effects of treatment could encourage client interest in starting treatment, programs must consider who is providing such information and advice. Workers who lack formal medical training may best serve clients by directing them to low-barrier HIV treatment providers with appropriate skills, knowledge, and expertise, such as providers who have experience working with people who use drugs.

ART adherence

Studies exploring ART among people who inject drugs have suggested lower rates of adherence in this population than in other groups (Carrieri et al., 2003; Palepu et al., 2006; Wood et al., 2004) and many discontinue HIV treatment soon after it has been initiated (Wood et al., 2004). Studies show that while HIV treatments can be as effective among people who inject drugs as they are among those who do not inject drugs, poor adherence leads to lower rates of HIV suppression and reduced CD4 cell count responses (Wood et al., 2003; Palepu et al., 2003). A number of modifiable factors appear to play a role in adherence to ART among people who inject drugs, such as perceptions of ART side effects, client beliefs about their ability to take ART properly and social support.

Fear of side effects

In a study of factors related to ART adherence among people who inject drugs in Vancouver, participants who believed that ART medications would cause unpleasant side effects were more likely to discontinue treatment (AOR = 1.41, 95% CI: 1.2 to 1.6; Kerr et al., 2005).

Self-efficacy to take ART correctly

Client beliefs about their ability to take ART medications have been shown to be associated with concerns about adherence. In a prospective cohort study exploring psychosocial factors related to ART adherence among 108 people who inject drugs in Vancouver, Kerr et al. (2004) found that participants who exhibited high self-efficacy expectations (they believed they would be able to take medications at the correct times and manage treatment side effects) had greater adherence to ART (AOR = 1.8, 95% CI: 1.0 to 3.1). In a similar Vancouver study of 160 HIV positive people who inject drugs, higher self-regulatory efficacy (confidence in one's ability to take medication while using drugs or in withdrawal) and higher efficacy expectations (confidence in

one's ability to remember medications and take them as directed) were found to be independently negatively associated with ART discontinuation (AOR = 0.86, 95% CI: 0.7 to 0.9; AOR = 0.70, 95% CI: 0.5 to 0.9, respectively; Kerr et al., 2005). It appears then, that patients' level of confidence in understanding how to take medications and perceived self-efficacy plays a large role in actual medication adherence.

Social supports, stable housing, and patient-provider relationship

Perceived social support has been shown to play a role in achieving viral suppression and greater medication adherence. In a cross-sectional study of 466 people in four US cities receiving ART and also reporting injection drug use in the previous year, achieving greater viral suppression was independently associated with reporting social support (participants answered questions on a four-point scale about having someone to talk to about personal issues and confide in) (Adjusted Odds Ratio [AOR] = 4.86, 95% CI: 1.08 to 21.93) and stable housing (defined as currently having a place to stay at least five nights per week) (AOR = 3.62, 95% CI: 1.02 to 12.89) (Knowlton et al., 2006).

In addition, positive patient-provider communication has been implicated in achieving better HIV treatment outcomes. For example, Knowlton et al. (2006) conducted a cross-sectional study using data from the INSPIRE study, a secondary HIV prevention intervention conducted in four US cities that explored factors associated with achieving undetectable viral load in people currently injecting drugs and on ART. They found that of 466 participants, those who reported better patient-provider communication achieved improved viral suppression (AOR = 1.57, 95% CI: 1.01 to 2.45; Knowlton et al., 2006). The patient-provider relationship may also play a role in improving client confidence and efficacy in taking ART. In another study using data from the INSPIRE sample, exploring correlates of ART adherence among 636 people who inject drugs, those who disclosed drug use to their medical provider were less likely to make medication errors ($p < 0.05$; Arnsten et al., 2007), suggesting patient-provider relationships play a role in accurate self-administration of medications.

Interventions to address ART adherence

Case management refers to assessment, planning and advocating for services that will meet client health needs. NSPs may already perform activities similar to case management with their clients to assist them in accessing HIV treatment

providers, housing, and food services. Given the link between adherence to ART and social supports, NSPs can play a role in providing clients with information about available social services.

A mobile ART delivery model proved effective to initiate participants on ART during a pilot study in New Haven, Connecticut, with 13 people living with HIV who inject drugs but were not on HIV treatment (Altice et al., 2003). More than half of those who started ART had an undetectable viral load after 12 months of enrollment (Altice et al., 2003). Adherence to antiretroviral medications has been shown to improve following directly administered therapy (DAART), a strategy where HIV treatment providers or program staff directly administer ART or observe patients taking ART medication. In a US randomized controlled trial spanning six months, where 141 participants from New Haven received either a DAART intervention through a community-based mobile health van or self-administered therapy, the group receiving the DAART showed greater viral suppression compared with the control group (Altice et al., 2007). Though some questions remain about which patients may benefit from DAART and when to initiate DAART for optimal results, the authors suggest that DAART programming can provide much needed social and medical support to people living with HIV who use drugs. Similarly, other forms of medication reminders may prove useful in assisting people who use drugs to adhere to ART.

NSPs may already offer outreach services to access hard-to-reach clients. While daily medication reminders may not be feasible in all settings, NSPs could consider offering DAART if funding and staffing resources allow. NSPs wishing to offer this service to clients should consider how DAART is integrated into existing programming and ensure that all services reflect values of dignity, privacy, and autonomy. NSPs may also be able to assist clients in remembering medical appointments. To address client concerns about side effects, NSP staff can connect clients to HIV treatment providers who offer low-barrier services and have appropriate skills, training, and expertise.

Linkage to HCV treatment providers

While few people who acquire HCV experience symptoms of acute infection, if left untreated chronic HCV can result in liver cirrhosis (scarring of the liver), liver failure, and hepatocellular carcinoma (cancer of the liver) (WHO, 2014). People who inject drugs account for the majority of HCV cases in Canada; in 2007, active injection drug use accounted for

83% of new cases of HCV (Remis, 2007). However, HCV testing and subsequent HCV treatment remains a challenge for people who use drugs. In a national sample of people who inject drugs, among those who tested HCV positive, over one-quarter were unaware of their positive HCV status prior to being tested in the study (PHAC, 2013). In addition, only half of those who knew their status were consulting a physician for HCV care, while 10% of these individuals reported ever receiving HCV treatment (PHAC, 2013). This is concerning, as effective HCV treatment can play an important role in reducing the negative health effects of HCV infection, as well as reducing the risk of further HCV transmission. There are a number of reasons why effective HCV treatment is difficult to access, however, including the limited number of treating physicians and costs of HCV treatments. While spontaneous clearance of HCV is known to occur, most individuals will require treatment (WHO, 2014). HCV treatment success, evidenced by sustained virological response (SVR), has been steadily increasing, such that current antiviral drugs for genotype 1 achieve an SVR of greater than 90% (WHO, 2014).

Antiviral treatment is indicated for people diagnosed with HCV, yet uptake remains low among people who inject drugs. In a study exploring knowledge of HCV treatment among a cohort of people who inject drugs in Baltimore, Mehta et al. (2008) found of 597 participants, 70% were aware that HCV treatment was available, but only 22% of this group understood that it could resolve HCV. Furthermore, only 4% had ever initiated HCV treatment. While the majority (56%) had never discussed HCV treatment with a healthcare provider, many of these participants (71%) indicated interest in initiating HCV treatment (Mehta et al., 2008).

Despite low uptake, antiviral treatment has been shown to be just as effective at achieving sustained virological responses among people who inject drugs compared with others who have HCV (Bruggmann, 2008; Lindenburg et al., 2011). In a Swiss study exploring the impact of continued injection drug use on sustained virological response, Bruggmann et al. (2008) compared a group of people who inject drugs and a control group with similar rates of adherence and found no statistical difference in viral suppression between the two groups. Literature increasingly calls for improved access to HCV treatment among people who inject drugs, yet a number of important barriers to uptake of HCV treatment exist. Many of these barriers are modifiable and NSPs can play a role in reducing or eliminating these barriers.

Client concerns about initiating HCV treatment

Evidence suggests people who use drugs and are living with HCV are reluctant to start HCV treatment due to fear of side effects, invasive procedures, and lack of knowledge about the HCV treatment course (Mehta et al., 2008; Harris, 2009; McNally et al., 2006; Schackman et al., 2007). In a qualitative study of HCV treatment experiences among people living with HCV who inject drugs in Ireland, Swan et al. (2010) found that among 36 participants, many were less interested in starting HCV treatment if they were presently asymptomatic and had fears about invasive medical procedures associated with receiving medical care, such as a liver biopsy. Participants cited negative HCV treatment experiences within their peer networks and lack of knowledge about what initiating HCV treatment would entail as contributing to their lack of interest in HCV treatment (Swan et al., 2010). Similarly, in a qualitative study in New York of 69 HCV treatment naïve participants with current or past injection drug use experience, many who were offered HCV treatment declined it due to lack of current HCV-related symptoms, fear of side effects, and concerns about invasive procedures (Schackman et al., 2007). In addition, many in this study had reservations due to inadequate information about possible HCV treatment outcomes and side effects (Schackman et al., 2007).

Interventions to support initiation of HCV treatment

Peer-based education and support have been described as facilitating access to and uptake of HCV treatment among people living with HCV who use drugs. In a Vancouver study exploring HCV treatment initiation and outcomes among 109 people living with HCV who use drugs, attending four weekly peer support groups predicted HCV assessment (OR = 6.03, 95% CI: 3.27 to 11.12), and 54% of those assessed initiated HCV treatment (Grebely et al., 2010). Sylvestre and Zweben (2007) describe a model for providing peer-based education to clients who use drugs on their path to HCV treatment. The model uses a medical provider and a peer group with lived experience of HCV who had successfully completed HCV treatment in Oakland. This pre-HCV treatment education group provided clients with an opportunity to connect with peers, learn about their experiences, and ask questions of the medical staff, resulting in increased engagement with some of the difficult-to-reach and underserved clients (Sylvestre & Zweben, 2007).

NSPs can connect clients to healthcare providers who can provide information about HCV, options for HCV treatment, and information about medication side effects. Programs

must consider who is providing such information and advice. Workers who lack formal medical training may best serve clients by directing them to low-barrier HCV treatment providers with appropriate skills, knowledge, and expertise. Clients who are considering HCV treatment and voice an interest in seeking medical advice can be connected with an HCV treatment provider to discuss HCV treatment options and meet client needs. In addition, and where feasible, a peer-based intervention could provide support to clients living with HCV and considering HCV treatment.

Provider-related and institutional barriers to uptake of HCV treatment

Despite evidence that shows HCV treatment can be just as successful in people who inject drugs, compared to those who do not (Van Thiel et al., 2003; Bruggmann et al., 2008), many providers still have concerns about prescribing antiviral medications to clients who inject or otherwise use drugs, due to a number of interrelated challenges and complexities (Cooper, 2008). Inability to adhere to HCV treatment and the risk of re-infection are often cited as factors that prevent providers from offering antiviral medications to people who inject drugs (Grebely & Tyndall, 2011; Myles et al., 2011). However, a recent review of studies suggests HCV viral suppression can be successfully achieved among this population (Hellard et al., 2009). While HCV re-infection rates among people who currently inject or have a history of injecting drugs have been found to be low (Grebely et al., 2010), the high costs of new treatments make it important for NSPs to educate clients about safer injection and ways of preventing re-infection.

In a study of 528 HCV specialist physicians from across Canada, only 19% were willing to provide HCV treatment to patients who were actively injecting drugs (Myles et al., 2011). Providers were more likely to be willing to provide HCV treatment to people who inject drugs if they were infectious disease specialists (OR = 3.27, 95% CI: 1.11 to 9.63) and if they practiced in a larger population community ($\geq 500,000$ population vs. $< 500,000$ population, OR = 4.16, 95% CI: 1.36 to 12.71; Myles et al., 2011).

The importance of building a trusting patient-provider relationship has been implicated in greater willingness of providers to prescribe HCV treatment and better patient retention in care. In a study exploring accessibility and quality of HCV treatment among people who inject drugs in London, UK, Harris et al. (2013) interviewed 35 service users and 14 healthcare workers (primarily physicians and nurses)

and found that familiarity of place and healthcare worker played a role in encouraging service users to return for HCV treatment follow-up. In addition, building trusting relationships, reducing eligibility criteria, as well as modifying HCV treatment regimens were all cited as ways to enhance client-provider interactions and assist in meeting client needs.

People living with HCV who inject drugs often report being stigmatized by healthcare staff and in healthcare settings (Brenner et al., 2007; Habib & Adorjany 2003; Hopwood et al., 2006; Swan et al., 2010). People who inject drugs often have negative encounters with the healthcare system which discourages them from accessing healthcare in general, and also from engaging with HCV treatment providers and starting HCV treatment (Harris et al., 2013; Lally et al., 2008; Swan et al., 2010).

Harris et al. (2013) conducted a qualitative study in London, UK to explore both patient and healthcare provider perspectives on access to and provision of HCV treatment. The authors identified the following themes as related to delayed HCV treatment initiation: a lack of healthcare system flexibility; strict eligibility requirements, such as reduced access for those actively using drugs; and stressful experiences with phlebotomy (blood work) (Harris et al., 2013). In addition, a similar Irish study exploring HCV treatment experiences of 36 people who use drugs cited drug abstinence requirements for HCV treatment as a reason to delay initiation (Swan et al., 2010). Inaccessible service locations or those that involve multiple sites are also problematic for people who inject drugs and Swan et al. (2010) report inconvenience of HCV treatment location as a barrier to seeking HCV treatment. In addition, client dropout from regular HCV care has been associated with reduced initiation of HCV treatment (Schackman et al., 2007) suggesting continuity of care needs to be improved for this population. It is clear from these studies that numerous institutional barriers exist to prevent or discourage people who use drugs from accessing necessary HCV treatment and related services.

People who inject drugs often face a number of social challenges, including reduced access to social supports and services. Harris and Rhodes (2013) identify housing, geographic access, criminalisation, gender, and culture as key social factors that affect access and uptake of HCV treatment. In addition to accessing an HCV treatment provider and initiating HCV treatment, social challenges likely affect how HCV treatment is prioritized. Providing HCV treatment in a community setting may reduce some of the traditional barriers to HCV treatment access and so-called rules of the hospi-

tal setting, such as a requirement to be abstinent, strict appointment times, and inflexible approaches to blood work (Harris et al., 2013).

Interventions to support patient-provider relationships and removing institutional barriers to HCV treatment

Patient-provider relationships described as ‘trusting’ are associated with increased interest in starting HCV treatment among people who inject drugs (Harris et al., 2013). NSP staff can advocate for clients and direct them toward HCV treatment providers who have existing relationships with the NSP or offer low-barrier services to people who use drugs. NSPs already engage people who use drugs in services and likely have also fostered the formation of trusting relationships between clients and facility staff, as evidenced by clients’ continued use of the facility. Service users may already consider NSPs to be safe places in which to receive health and social services and resources, making them ideal locations from which to provide referrals to HCV treatment providers.

Few studies have evaluated uptake of HCV treatment following referral from an NSP. In one Australian study by Islam et al. (2012), the authors describe a joint NSP and primary healthcare centre in Sydney that provides HCV testing and referral for HCV treatment at an off-site liver clinic. Of 33 clients who tested positive for HCV during the study period and were referred to the liver clinic from the NSP, only 16% attended the appointment and none commenced treatment (Islam et al., 2012). This highlights the need to develop and evaluate referral mechanisms to connect clients with HCV treatment providers.

Birkhead et al. (2007) describe how NSPs can offer a variety of HCV-specific services to people who inject drugs. In addition to providing HCV testing, case management to assist clients in linking with HCV treatment providers, additional training on hepatitis and HIV co-infection was provided to NSP staff. While this study did not evaluate the efficacy of HCV training among staff, heightened awareness of HCV treatment options and HCV-related community services would allow NSP staff to appropriately link clients to these services. Case studies such as this could benefit from evaluation – to measure efficacy of staff HCV training and determine effective strategies to refer clients to HCV treatment providers.

Non-injection drug use

While the majority of literature explored in this chapter focuses on facilitators and barriers to treatment uptake among people who inject drugs, it is important to note that non-injection drug users also require timely referral to HIV and/or HCV treatment providers. The recommendations provided herein, therefore, are relevant to both people who inject drugs and those who use non-injection drugs.

HIV and/or hepatitis C treatment referrals evidence summary

The evidence that informs this chapter and its recommendations came from mostly observational studies, particularly cross-sectional and prospective cohort studies. Numerous non-systematic reviews have contributed evidence on a broad array of factors influencing access to, uptake of, and adherence to HIV and HCV treatment. While randomized controlled trials (RCTs) are generally considered to provide the highest quality evidence for evaluating health interventions, only one RCT was found to demonstrate efficacy of an adherence intervention. Many other interventions aimed at improving uptake of and adherence to HIV and/or HCV treatment were explored through descriptive and case studies, making it difficult to assess their effectiveness. A number of qualitative studies exploring client perspectives on accessing, initiating, and adhering to HIV and/or HCV treatment have added to our understanding of important barriers and facilitators to treatment. In addition, cross-sectional and qualitative studies that focus on healthcare provider perceptions have added additional perspectives on how HIV and/or HCV treatment is made available and associated challenges. Little evidence is available to suggest effective mechanisms for connecting NSP or other harm reduction program clients who are living with HIV and/or HCV to HIV and/or HCV treatment. Thus, evaluative work with a focus on specific interventions that connect harm reduction program clients to HIV and/or HCV treatment and care providers is needed.

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9

Substance use treatment referrals



RECOMMENDED BEST PRACTICE POLICIES to increase access to substance use treatment for people who use drugs:

- Educate clients about substance use treatment options (e.g., detoxification, drug substitution programs, and psychotherapy)
- Refer clients to substance use treatment programs in the community
- Establish and maintain relationships with a variety of agencies providing substance use treatment services, including services for illicit drug use as well as alcohol and/or tobacco use
- Educate program staff on how to properly assess and respond to client motivation and readiness for substance use treatment
- Assess feasibility of co-locating low-threshold substance use treatment programs within needle and syringe programs (NSPs)/harm reduction programs and vice versa
- Evaluate and publish any referral initiatives (e.g., brief interventions or formal referrals) undertaken

Defining substance use treatment

By offering referrals to substance use treatment, harm reduction programs can be a bridge to client enrollment in treatment and thus another avenue to reducing drug-related harm. Although “substance use treatment” can be used as an umbrella term, it is important to recognize that there are numerous substance use treatment modalities including inpatient and outpatient programs, detoxification and withdrawal management, pharmacotherapy or drug substitution programs (e.g., methadone, Suboxone), psychotherapy, group counselling, and more. For people who inject drugs like heroin and other opiates, a well-known form of treatment that effectively reduces injection-related risk behaviours is substitution therapy, particularly methadone maintenance treatment (MMT; Gowing et al., 2008), which is the type of treatment participants were referred to in many of the studies reviewed in this chapter. In an international review of different approaches (e.g., pharmacotherapy and behavioural interventions), the World Health Organization (WHO; 2005) concluded that controlling the spread of HIV is most successful when there are a variety of comprehensive drug treatment services available. Substance use treatment reduces “transmission of HIV and many other blood-borne infections through reduction of drug use and improved psychosocial and health functioning” (Kidorf & King, 2008, p. 488).

Clients may also benefit from having a variety of substance use treatment options. As such, harm reduction programs can investigate local client needs and tailor referral services

to meet those needs, including taking note of what services clients can realistically access and/or afford. Most of what is available in the literature regarding referral from NSPs to substance use treatment programs focuses on treatment for people who inject opiates. There is much less literature regarding treatment options and referrals for stimulant and other drug use, though there is some emerging evidence about treatment services available for people who use drugs like cocaine and other stimulants (Karila et al., 2008; Shoptaw et al., 2009).

Referral types

The literature we reviewed often treats “referrals” as another umbrella term. We know from Canadian service providers that harm reduction program referrals to substance use treatment may take different forms. Sometimes programs approach referrals like brief interventions (see Meader et al., 2010; Ritter & Cameron, 2006), where typically a discussion takes place between program staff and a client and the client is provided with additional resources or a number to call for more information about substance use treatment services. At other times, and/or at programs with more resources (including specialized staff like clinical and social workers), the referral process is more formalized and involves a healthcare provider referral, documentation, and follow-up.

A considerable amount of the evidence that informs this chapter came from a large American study, where referrals were made to opiate substitution therapy, including MMT,

and participants were followed to track trends in treatment entry/enrollment, retention, and outcomes. Based on annual survey data from NSP directors across the United States, referrals to substance use treatment are among the most commonly provided services; 92% of programs that participated in the survey in 2007 reported these referrals (Des Jarlais et al., 2009). While these referrals are widespread, NSPs and other harm reduction programs should also be cautious about overemphasizing substance use treatment. Some clients may be unsure or not ready to discuss substance use treatment options and thus overemphasis on these referrals may alienate clients and discourage their future program attendance. Formalized referral and tracking may not be the most common referral type across Canada, according to what we have learned from community-based service providers. Nonetheless, the existing evidence is informative, especially where such referrals exist and for programs that aim to implement a more formalized referral process.

There is literature on readiness to change and substance use treatment readiness (e.g., Alley et al., 2014; DiClemente et al., 2008; Handelsman et al., 2005). Harm reduction programs may wish to consider staff training and education on how to assess client motivation or readiness for substance use treatment.

Feasibility of co-locating substance use treatment with harm reduction services

NSPs and other harm reduction programs may want to consider the desirability and feasibility of providing substance use counselling and treatment services on site. On-site substance use treatment would give interested clients a chance to receive multiple services in one place. An obvious practical barrier to this is lack of resources or funding, especially for programs that may already be resource strained. Client preferences and comfort are also important, such as whether clients would perceive an expectation that they enter substance use treatment if it is co-located with their NSP and/or if clients accessing treatment services at an NSP would feel “triggered” (i.e., experience an urge to use drugs). There are gaps in the literature regarding these issues and it would be beneficial if new studies could explore these possibilities in detail. Kidorf and King (2008) suggest that part of the issue behind little advancement in efforts to integrate NSP and substance use treatment services might be “conceptual barriers.” For instance, some substance use treatment programs may not wish to affiliate with NSPs out of concern about sending the “wrong message” and/or because the two may not share an abstinence orientation. Generally speaking,

treatment programs focus on reducing substance use, while harm reduction programs focus more on reducing high-risk behaviours. Kidorf and King (2008) offer several practical recommendations to strengthen the integration between NSPs and substance use treatment programs: greater efforts by NSPs to motivate clients’ treatment-seeking behaviour; working towards reducing the conceptual barriers between NSPs and substance use treatment programs (e.g., training programs and seminars that bring together service providers from both); and improving access to substance use treatment programs (e.g., target existing treatment slots). NSPs and other harm reduction programs should involve their clients in assessing whether provision of substance use treatment referrals or services on site would meet local needs and improve service uptake.

Substance use treatment services that might work particularly well on site at NSPs and other harm reduction programs are low-threshold services. Although there have been varying definitions of “low-threshold”, Islam et al. (2013) suggest three essential criteria for defining low-threshold programs:

- 1) They offer services specifically for people who use drugs
- 2) Abstinence is not required as a condition of service use
- 3) Efforts are made to facilitate and reduce barriers to service entry (e.g., client engagement, confidential registration, peer support, free services).

In contrast, high-threshold substance use treatment programs present more conditions of service use, often but not always with the expectation that clients abstain from substance use during treatment. For example, MMT can be delivered as high- or low-threshold. There are two longstanding examples of NSP-MMT integration from Kingston and Toronto, Ontario (Millson et al., 2007). According to Millson et al. (2007), low-threshold MMT aims to establish and maintain contact and trust with people who use opiates. Compared to their higher-threshold counterparts, low-threshold MMT programs typically reduce treatment entry and retention criteria and will accept (and *not* expel) clients who continue to use drugs.

As well as adding substance use treatment services to harm reduction programs, the reverse may also improve access to harm reduction services for those in treatment. Deren et al. (2011) surveyed 114 staff at eight MMT clinics in New York and New Jersey. The majority of staff (90%) supported adding medical services to MMT clinics. Sixty-eight percent en-

dorsed that it was a “good or very good idea” to provide sterile syringe access and 81% endorsed provision of safer syringe disposal. Having higher education and knowledge of HIV were correlates of these favourable attitudes regarding service provision.

Providing referrals to substance use treatment

A number of studies demonstrate the important role that NSPs and other harm reduction programs may play in helping clients identify available resources and referring them to substance use treatment. Some people who use drugs may not have their service needs met due to lack of knowledge about how to access community resources or perceptions of ineligibility. Further, many people who use drugs feel marginalized and fear stigmatization by healthcare and other service providers, making them reluctant to seek services including substance use treatment (Hankins, 1998). Harm reduction program staff have a role to play in helping clients identify available substance use treatment resources in the community and talking to clients about their potential treatment readiness. Although Hudoba et al. (2004) did not provide much detail about the program, they conducted a pilot evaluation of an Australian initiative, the “First Step” project, designed to increase NSP staff training around engaging people who inject drugs in health and social services and allowing staff to apply their new skills. The authors found that referral rates to substance use treatment increased significantly from 44% to 49% between pre- and post-implementation.

A study by Porter et al. (2002) showed that not all clients are aware that NSPs provide substance use treatment referral services. Porter et al. (2002) compared how two samples of people who inject drugs in Philadelphia – NSP users (n=26) and non-users (n=20) who lived near an NSP – perceived and used NSP-offered services, including drug treatment referrals. Nearly two-thirds of both samples had experienced drug treatment episodes; a higher proportion of NSP non-users were in treatment at the time of the study. Nearly all those currently in drug treatment were registered in MMT, which was also the most commonly reported type of long-term previous drug treatment for both samples. Porter et al. (2002) assigned individuals to four categories in a typology of awareness and use of NSP services: active involvement, “steppingstone,” vague awareness, and unaware. The majority of people who used the NSP and were aware of its services were not in drug treatment at the time of the study, though some had used drug treatment referral services provided by a caseworker or staff. Many partici-

pants in the steppingstone group were aware that the NSP provided referrals and viewed the NSP as a step to getting “help” should they become interested or decide to do so. Participants in the other two categories were either vaguely aware or lacked knowledge of NSP services beyond provision of safer injecting equipment. People who did not use the NSP were generally unaware that the site offered referrals to drug treatment and other services. Porter et al. (2002) noted the important role of social networks – many who used the NSP were at least aware of referral services and could serve as conduits for getting such information out to peers who did not attend the NSP.

A study by Stein and Friedmann (2002) showed that NSPs play an important role in referring clients to community services, including drug treatment, that are not provided on site. They examined the self-reported perceived and unmet service needs of HIV-negative people who inject drugs and were either not receiving drug treatment (n=251, recruited from the Providence, Rhode Island, NSP) or were receiving drug treatment (n=312, recruited from an MMT program). While both groups of participants had unmet service needs, 94% of NSP clients reported at least one unmet need, versus 62% of MMT clients – and 80% of NSP clients reported that they needed drug treatment. Further, NSP clients reported significantly greater service needs for housing, mental health care, and alcohol treatment compared to MMT clients.

Referrals to substance use treatment can be integrated into harm reduction outreach programs. For example, Deering et al. (2011) examined prospective cohort data available from an 18-month period (2006 to 2008) about the use of a mobile outreach program and the uptake of substance use treatment among street-level female sex workers in Vancouver. The peer-led mobile access van offered female sex workers a safe place to rest and have food, coffee, and water during their shifts; responded to calls from women; and provided harm reduction supplies, including syringes. Compared to women who did not report use of the van, reporting use of the program in the last six months was independently associated with increased odds of using inpatient drug treatment (detoxification, residential drug treatment). This finding held after controlling for drug use, environmental-structural factors, and outpatient treatment. Deering et al. (2011) suggested that future research should investigate specific characteristics of mobile outreach programs that may help connect women to inpatient substance use treatment and other services.

Substance use treatment entry/enrollment

In this section, we review evidence related to substance use treatment entry among clients of harm reduction programs. Many NSP clients express an interest in substance use treatment (Heimer, 1998; Kidorf et al., 2005), although interest does not mean the same thing as motivation to enroll in treatment. Studies reviewed by Kidorf and King (2008) showed low rates (5% to 15%) of treatment enrollment among NSP clients who were given referrals. Certain mental health issues could impact willingness to seek and enter substance use treatment among NSP clients. Key social-structural factors or barriers such as costs, transportation, childcare, and social expectations may also impact treatment enrollment as much as a person's personal motivation.

Regarding mental health issues, Havens et al. (2007) found that people who inject drugs and had antisocial personality disorder (ASPD) were as likely as those without ASPD to enter substance use treatment – a surprising finding given that those with ASPD scored higher on measures related to drug use and other problems. Using the same sample of 281 participants from the Baltimore NSP as Kidorf et al. (2009) – described below – Kidorf et al. (2010) examined psychiatric symptoms as a predictor of substance use treatment enrollment. Over a four-month follow-up period, participants completed monthly study assessments that included measures of substance use, risk behaviours, and psychiatric symptoms. Logistic regression analysis found that higher scores of psychiatric symptoms predicted greater substance use treatment enrollment after controlling for study condition, demographic variables, NSP location, and drug use severity. The authors suggested that NSPs might be able to improve rates of successful substance use treatment referrals by targeting people who inject drugs and have high levels of psychiatric symptoms.

Between 1994 and 1998, Strathdee et al. (1999) interviewed 1,483 people who inject drugs receiving HIV tests six months prior to the opening of the Baltimore NSP and semi-annually thereafter to examine the role NSP attendance and health services contact plays in entry to detoxification. Both healthcare utilization and NSP participation were found to be associated with entry into a detoxification program for HIV-negative and HIV-positive people who inject drugs. HIV-positive people who inject drugs were also almost twice as likely to enter detoxification if they had recently seen a physician compared to those who had not and were over three times more likely to enter a drug treatment program in the first year after the NSP opened. However, this associ-

ation between NSP attendance and drug treatment entry declined with time.

Riley et al. (2002) examined uptake of MMT following referrals from the Baltimore NSP. Participants were informed that referrals to off-site MMT were available upon request. Among the 2,659 participants who enrolled at the NSP between 1994 and 1997, 437 referrals were made to two treatment centres. Among these referrals, 139 were made to a single treatment program from which data were available; analyses were restricted to this subgroup. Thirty-nine (28%) actually entered MMT. Comparisons revealed that women were more likely to request a referral than men, but men were twice as likely to actually enter treatment. Requesting MMT referrals was also associated with being older than age 38, use of “speedballs” (heroin and cocaine combinations) during the last six months, and having started injecting after age 20. Among those who reported that they were unable to use referrals, the most common reasons were not having health insurance and not finding open treatment slots. Other barriers included living too far from the drug treatment centre, work schedule conflicts, becoming incarcerated, not having money, and expecting a lot of paperwork.

Lloyd et al. (2005) studied 245 people who inject drugs who attended one of the Baltimore NSP's 13 mobile van sites. Ninety-six (39%) participants entered either MMT or another opiate agonist treatment (LAAM, which is now contraindicated) within 30 days of enrollment in the study. Multivariate analyses showed that compared to those who lived alone or in non-stable environments such as on the streets or in a housing program, those who lived with a sexual partner were three times more likely to enter drug treatment and those who lived with friends or family were nearly three times more likely to do so. These findings highlight the role that supportive social environments may play when it comes to encouraging drug treatment entry.

Kidorf et al. (2005) examined the substance use treatment interest and motivation among 302 participants newly registered to the Baltimore NSP, recruited between 1999 and 2002, who were randomly assigned to three different conditions: a referral with motivational interviewing (MI), a referral involving job readiness (an attention-control group), or a standard referral. MI involves empathic counselling and can be delivered in only one session. The MI referral condition involved a 50-minute structured intervention designed to increase problem recognition and the likelihood of substance use treatment entry. Kidorf et al. (2005) found that although participants from all referral categories showed

a high degree of interest in receiving substance use treatment, only 11% enrolled in substance use treatment during the one-year observation period. Caucasian clients and those diagnosed with major depression were more likely to enroll in treatment. Participants referred through the MI condition did not show more substance use treatment interest or treatment-seeking behaviour than the other two referral groups; thus we may question the impact of using MI as part of the process to refer clients to substance use treatment. However, the authors suggested that perhaps increasing the number of MI sessions would better help clients recognize their substance use treatment ambivalence and develop strategies to access treatment.

Strathdee et al. (2006) studied Baltimore NSP clients who sought drug treatment between 2002 and 2004. Clients who requested drug treatment received a referral voucher for either MMT or LAAM when drug treatment slots were available. In this trial study, participants were randomized to either a case management intervention, based on a Strengths-Based Case Management (SBCM) model, or a control (passive referral) condition. In the intervention, case managers worked with clients to assess and build upon their strengths, address potential barriers to treatment such as transportation issues and child care, and facilitate drug treatment entry. Out of 245 participants, 128 (52%) were randomized to the intervention and 117 (48%) to the control condition. Among the 128 in the intervention condition, 104 (81.3%) used some case management services. In a final multivariate model, receiving more case management time independently predicted drug treatment entry; those who received 30 minutes or more of case management time within a week of their baseline visit were 33% more likely to start drug treatment. Also of note was the finding that people with access to a vehicle were nearly three times more likely to enter drug treatment. Assisting drug treatment-seeking clients with transportation needs may thus be an important consideration for programs.

Another way to potentially improve substance use treatment enrollment is to provide incentives to NSP clients as part of the referral process. Kidorf et al. (2009) examined data from 281 opioid-dependent participants newly registered with the Baltimore NSP, who were recruited between 2003 and 2007. Participants were randomly assigned to one of three referral conditions: a motivated referral condition (MRC) involving eight individual motivational enhancement sessions and 16 group treatment readiness sessions; the same motivated referral condition plus monetary incentives for attending sessions and treatment enrollment (MRC+I); and

standard referral. Incentives for attending the motivational enhancement and treatment readiness sessions included \$10 cash, \$10 gift certificates for fast food, and \$3 day bus passes. Those who entered treatment, including MMT, received a \$50 voucher to help offset intake and admission fees. The study followed participants for four months and overall 40% enrolled in substance use treatment (mostly MMT, though some opted for in- and out-patient detoxification and other modalities). Compared to MRC and standard referral participants, MRC+I participants were more likely to enroll in any kind of substance use treatment, more likely to enroll in MMT, and reported less heroin use and injection drug use.

Substance use treatment retention

The retention of people who inject drugs in substance use treatment can be a challenge. Using data from the same randomized trial as Strathdee et al. (2006), Havens et al. (2009) examined predictors of retention in MMT among people who inject drugs and were referred to drug treatment by an NSP. Havens et al. (2009) found that median retention for 127 participants who enrolled in drug treatment was 7.9 months; over two-thirds (69%) of participants stayed in drug treatment for at least 90 days. Having received the case management intervention or being in the control condition was not associated with longer retention. Those who had previous drug treatment experience and multiple requests for drug treatment were retained significantly longer, while being employed and higher levels of psychiatric symptoms predicted shorter retention. Social and environmental factors that negatively affected MMT retention were unstable housing, buying drugs for others, and living farther from the treatment location.

Kidorf et al. (2011) reported on substance use treatment reengagement outcomes among 113 NSP participants who enrolled in treatment as part of the clinical trial described by Kidorf et al. (2009). Those who were in the MRC group (n=31) could attend group sessions aimed at renewing interest in substance use treatment. MRC+I participants (n=49) were offered monetary incentives for attending the treatment interest-renewal sessions (\$10 cash, \$3 bus passes) and for re-enrolling in substance use treatment (\$50 voucher). Those in the standard referral condition (n=33) could not attend the group sessions or receive incentives. A large majority of study participants (86%) were discharged from substance use treatment during a 12-month observation period. Those in the MRC+I condition attended more group sessions than those in the MRC condition and were more

likely to re-enroll in substance use treatment compared to participants in the other study conditions. Thus, incentives may increase substance use treatment reengagement among people who inject drugs referred to treatment by NSPs. However, Kidorf et al. (2011) noted that implementing incentive-based reengagement interventions at NSPs may have limited feasibility. Also, the design of the studies by Kidorf and colleagues do not allow for deeper understanding of the pathways through which incentives or reinforcement lead to substance use treatment entry and/or reengagement.

Related outcomes

Research demonstrates a positive impact of drug treatment – particularly substitution therapy like MMT – on HIV and HCV prevention in people who inject drugs. In an older study, Monterroso et al. (2000) examined the HIV status, program participation, and risk reduction behaviours of 2,306 people who inject drugs in the multicity (Baltimore, New York, Chicago, Los Angeles, and San Jose) Collaborative Injection Drug User Study. Results showed that participation in NSPs and drug treatment programs substantially reduced the risk of acquiring HIV among people who inject drugs by reducing the likelihood of injecting with previously used needles. Reduction in injection frequency was strongly associated with participating in a drug treatment program. In a retrospective cohort study, Hallinan et al. (2004) examined the incidence of HCV in people who inject drugs receiving MMT or buprenorphine, another opiate replacement. Fifty-four participants who were HCV-negative upon entering drug treatment after January 1996 were retested before July 2003. There was only one seroconversion in the continuous therapy group (n=34) and four seroconversions in the interrupted therapy category (n=20), both of which represent low HCV incidence in this population. Furthermore, in their study of low-threshold MMT programs integrated within NSPs in Kingston and Toronto, Millson et al. (2007) reported that the proportions of participants injecting drugs, sharing needles and other drug equipment, indirectly sharing (e.g., backloading), and using communal shooting galleries declined between treatment enrollment and 6-month follow-up.

In a longitudinal study, Neufeld et al. (2008) compared one-year treatment outcomes for clients referred to MMT (which also included individual and group counselling and referrals to other services, as needed) by the Baltimore NSP (n=81) and people referred by other sources (n=243). Participants were recruited from 324 consecutive admissions to a drug

treatment service between August 1994 and September 1997. Compared to other referrals, people referred by the NSP were found to have experienced more drug use and were less likely to complete both six months and one year of drug treatment. However, the referral condition was no longer associated with treatment outcome after regression analysis that included other baseline variables; and the baseline variables strongly associated with treatment outcome (higher drug use severity and unemployment) were more prevalent in the NSP-referral group. These findings support the likelihood that NSPs refer people with more severe needs and poorer drug treatment prognosis.

Lloyd et al. (2008) used prospective data to examine whether opiate replacement therapy, MMT or LAAM in this study, was associated with decreases in the number of social network friends who use and inject drugs. Again using data from clients who sought drug treatment through the Baltimore NSP, the authors found that those who entered MMT or LAAM, compared to those that did not enter drug treatment, were more likely to report lower numbers of friends who used drugs and friends who injected drugs between baseline and follow-up measures, over an 18-month follow-up timeframe. These relationships held after controlling for other variables. Further studies could be done to investigate how drug treatment may play a role in changing the drug use-related social networks of people who attend NSPs.

Considerations for alcohol treatment and tobacco cessation

There are key health-related reasons why some clients should be encouraged to pursue substance use treatment, including treatment for alcohol and tobacco use which both carry a high burden of morbidity and mortality in general around the world (Rehm et al., 2006). Some people who use drugs also drink heavily (Anderson et al., 2001). Campbell et al. (2006) noted that alcohol use can be especially concerning among people with HCV as it accelerates liver damage and can reduce the effectiveness of HCV treatment. In their study of 598 HCV-positive people who inject drugs recruited from three American cities (Baltimore, New York City, and Seattle), Campbell et al. (2006) found that most participants seemed informed about their increased risk of liver disease from alcohol use. Despite this awareness, two-fifths of the sample were identified with problem alcohol use. Other research has found poor knowledge among people who inject drugs regarding factors, including alcohol use, which can accelerate HCV-related liver disease (Treloar

et al., 2012). Further, alcohol use is also associated with injection-related risk behaviours including sharing needles and other injection equipment (Matos et al., 2004; Stein et al., 2002a, 2002b). Brief interventions targeting alcohol use among people who inject drugs and attend NSPs can help reduce injection-related risk behaviours (Stein et al., 2002a) and alcohol consumption (Stein et al., 2002c); therefore it may be worthwhile for harm reduction programs to consider piloting such interventions with their clients.

Generally, harm reduction for alcohol has taken various forms to reduce injury and violence, road accidents, and social harms associated with alcohol use (Ritter & Cameron, 2006). Managed alcohol programs (MAPs) are an example of low-threshold services for people with severe alcohol use, particularly those who are marginally housed. Typically coupled with supportive accommodation or housing, MAPs dispense regulated doses of alcohol to help stabilize clients and reduce non-beverage alcohol consumption (e.g., rubbing alcohol, mouthwash) and other harms (Muckle et al., 2012; Stockwell et al., 2013). (Please see the Best Practice Recommendations: Part 1 chapter 6 on Alcohol swab distribution for more discussion of non-beverage alcohol consumption.) Clients often come to MAPs through shelters and sometimes emergency or hospital referrals (Perkin, personal communication, 2014). Currently, there is no clear picture of how common referrals are between MAPs and other harm reduction programs. These programs tend to serve different clients, although there might be some overlap. However, these two kinds of programs are sometimes run by the same organization and/or located nearby (Perkin, personal communication, 2014). Rigorous evaluation research on MAPs in Canada is underway (see www.carbc.ca/ResearchProjects/MAP.aspx, including preliminary results from Vancouver and Thunder Bay) which will likely provide useful information about existing and potential linkages between MAPs and other services, including harm reduction programs.

Another consideration for harm reduction programs is that people who use drugs and smoke tobacco are also likely to suffer from tobacco-related illnesses. Clients who express interest in tobacco cessation services may welcome readily available non-judgemental resources about where to get these services and/or whether these services are provided as options with other substance use treatment. In a study that compared smoking cessation interest among MMT clients and NSP clients, Clarke et al. (2001) found that 91% of 452 participants were current cigarette smokers and many were interested in smoking cessation. Those who were more likely to be contemplating smoking cessation within the next six months were in MMT, older than age 35, and did not show alcohol dependence. Clarke et al. (2001) suggested that while smoking cessation counselling should be offered to all who are interested, interventions could target older people in MMT.

Substance use treatment referrals evidence summary

Evidence that informs this chapter and its recommendations came from a mix of studies. Data from a randomised controlled trial (RCT) from Baltimore was used in a number of different studies in relation to NSP referrals to substance use treatment and treatment entry. We should be cautious regarding the generalizability of findings to other locations and contexts. RCTs are generally considered to provide the highest quality evidence for evaluating health interventions, though it is not always feasible or ethical to conduct RCTs with harm reduction programs and the populations they serve. Some observational studies – cross-sectional and prospective studies – provided information about NSP services and client use of services. Various types of evaluations contributed knowledge about outcomes from NSP referrals to substance use treatment programs. Reviews were also consulted for information about client needs and substance use treatment.

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10

Mental health services referrals



RECOMMENDED BEST PRACTICE POLICIES to increase access to mental health services for people who use drugs:

- Educate clients about mental health service options
- Refer clients to mental health services in the community
- Establish and maintain relationships with a variety of agencies providing mental health services, in particular those with experience working with people who use drugs
- Evaluate and publish any referral initiatives undertaken

Providing referrals to mental health services

Harm reduction programs, such as needle and syringe programs (NSPs), can play a key role in helping clients access mental health services. However, literature assessing the frequency and outcomes of these types of referrals is lacking. Below we briefly review the occurrence of mental health disorders and service needs among people who use drugs, including those who access harm reduction programs. There is a need for more research in this area, particularly in relation to the provision of service referrals.

Evidence of mental health issues

Many people who inject drugs and/or smoke drugs like crack cocaine have concurrent mental health disorders (e.g., Brooner et al., 1997; Canadian Centre on Substance Abuse, 2009; Cepeda et al., 2012; Kidorf et al., 2004; Rush et al., 2008a, 2008b). In Canada, there appear to be some regional differences in co-occurring substance use and mental health disorders, though these differences need additional study (e.g., higher rate of co-occurring disorders in British Columbia; Rush et al., 2008b). Sometimes evidence-based treatments are combined to enhance treatment effectiveness among people with concurrent substance use and non-substance use disorders (for a review, see Kelly et al., 2012). Prevalence of psychiatric disorders tends to be higher among women who use drugs compared to men (Krausz et al., 1998; Sordo et al., 2012; Torrens et al., 2011). Drug use can sometimes exacerbate existing or latent mental health symptoms such as increased risk of paranoia or psychotic symptoms (e.g., Mooney et al., 2006; Moore et al., 2007; Roncero et al., 2013). People who inject drugs and have concurrent mental health disorders have been shown to exhibit worse mental health symptoms, a greater likelihood of

suicidal behaviour and self-harm, fewer social supports and resources, a greater involvement with the criminal justice system, and high-risk behaviours for blood-borne infection (Darke et al., 2004; Woody et al., 1997).

Aitken et al. (2008) noted that research on mental health disorders among people who inject drugs likely fails to represent the experience of all people who use drugs because these studies tend to recruit from substance use treatment services (e.g., methadone maintenance treatment [MMT], detoxification programs, and residential programs) and may miss others who have not sought treatment. Thus, Aitken et al. (2008) argued that there is a need for more rigorous mental health prevalence research at NSPs to better inform policy and client referrals. The authors also mentioned some challenges associated with doing this research, including the observation that NSP clients tend to be transient and difficult to access. These authors suggested the use of brief, validated mental health screening tools that can be administered quickly in a range of environments and by staff who do not necessarily have mental health training. Using these tools, NSPs may be able to offer an opportunity for clients to receive basic mental health screening and referrals.

With the above caveat in mind, studies that have examined mental health disorders among out-of-treatment people who inject drugs and/or NSP clients have provided evidence of heightened rates of depression and other psychiatric conditions within these populations. Such studies further underscore the point that referrals to mental health services are an important consideration for harm reduction programs.

Brienza et al. (2000) examined the six-month prevalence of major depression in people who inject drugs participating in an NSP in Providence, Rhode Island (n=251) compared to

that of people who inject drugs enrolled in MMT (n=277). A higher proportion of those in the NSP cohort met the criteria for major depressive disorder (54%) than those in the MMT cohort (42%). Also, multivariate logistic regression showed that women, people with alcohol use disorders, and people without a current partner were more likely to be depressed.

A study by Kidorf et al. (2004) assessed the prevalence of psychiatric and substance use disorders among people who inject drugs and attended the Baltimore NSP. All study participants (n=422) were assessed for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) Axis I disorders and antisocial personality disorder (ASPD). Twenty-one percent of participants were found to have had lifetime major depression, the most common current and lifetime non-substance use disorder in the sample. Thirty-seven percent were diagnosed with ASPD and, overall, nearly 56% were diagnosed with either a non-substance use disorder or ASPD. The prevalence of substance use dependence in the sample was high; all participants met criteria for lifetime opioid dependence, while cocaine dependence was 78.3%, followed by alcohol dependence (68.4%) and cannabis dependence (51.4%). In terms of gender differences, women had a higher rate of post-traumatic stress disorder (10.5%) and showed a trend of higher rates of Axis I disorders (41.4%) compared to men (3.5% and 31.6%, respectively). Men were more likely to have diagnoses of ASPD (46.5%) than women (17.3%).

An analysis from a prospective cohort study, the Vancouver Injection Drug Users Study (VIDUS), found that people who inject methamphetamine were at increased risk of suicide attempts (Marshall et al., 2011). Among the 1,873 participants, 8% (n=149) reported a suicide attempt in the past six months, and methamphetamine injection was associated with an 80% increase in risk. Those who attempted suicide were more likely to be female, younger, and of Aboriginal ancestry (Marshall et al., 2011). Another study from Vancouver that used data from 1,931 participants from three prospective cohort studies – VIDUS, the ACCESS Cohort, and the At-Risk Youth Study – found a relationship between depression and non-fatal overdose (Pabayo et al., 2013). These authors observed that depressed men and women were more likely to have experienced a non-fatal overdose. It should be noted that such overdoses could be either accidental or intentional. For women only, those who had three or more persons for social support were less likely to experience a non-fatal overdose (Pabayo et al., 2013).

Evidence of unmet need for mental health services and service utilization

People with co-occurring substance use and mental health disorders have reported unmet service needs. Urbanoski et al. (2008) found that 22% of Canadians who had a disorder – and 51% with co-occurring disorders – perceived an unmet need for mental health services in the year prior to the survey. Harm reduction program clients have also reported unmet needs for mental health and other services. Stein and Friedmann (2002) reported that over two-thirds of HIV-negative people who inject drugs and who were recruited in Providence, Rhode Island, from an NSP (n=251) or enrolled in MMT (n=312) cited unmet needs for mental health and housing services. Neale et al. (2007) conducted qualitative interviews with 75 people who inject drugs, recruited from NSPs, from three areas of West Yorkshire, England. The authors asked participants about access to substance use and generic services and suggestions for improvement. Three broad suggestions were made: more service provision, including more substance use and mental health counsellors; enhancing operation of existing services (e.g., private rooms at services, 24-hour NSP services); and improvements related to staffing (e.g., less judgemental, better trained staff). Neale et al. (2007) also discussed other factors that participants identified as facilitators for seeking services, including having supportive relationships (especially with relatives), personal circumstances (e.g., becoming a parent), and state of mind (feeling motivated and staying positive).

Noël et al. (2006) examined use of health and social services among Canadians who use illicit opioids and were out of treatment. The authors analysed data from 677 participants recruited from Edmonton, Montreal, Quebec City, Toronto, and Vancouver. Participants reporting both physical and mental health problems used health services most often, followed by those reporting only physical health problems, and those reporting only mental health problems. Some city differences were observed. For example, Vancouver participants reported more visits to NSPs and women's centres, whereas Toronto participants reported more use of homeless shelters and other community-based services. Data from I-Track Phase 3, a large cross-Canada risk behaviour surveillance study of people who inject drugs, suggest a varying use of health care services depending on the type of service used. Regarding the use of "mental health and addictions centre" services, 23.7% (n=409) of participants used these services in the 12 months prior to the interview with a higher proportion of females (27.1%) reporting use of such ser-

vices than males (21.6%; Public Health Agency of Canada, 2014; Tarasuk et al., 2013).

Across Canada, the integration of substance use treatment and mental health services at both the service and system levels has been a burgeoning trend (Rush et al., 2008a; see also section on Mental Health and Substance Abuse at www.ccsa.ca). Discussing service integration involving substance use treatment and mental health treatment, Rush et al. (2008a) noted that benefits of integration may include improved screening and assessment skills of program staff, increased awareness of mental health and substance use issues, improved access and co-location of treatment services. However, potential risks of integration may include clients receiving additional services or treatments that are not needed, over-diagnosis and over-treatment, loss of specialized staff skills, and a more cumbersome bureaucratic system (Rush et al., 2008a). Given that what we know about integration comes from cases involving substance use treatment, we cannot be sure that the same benefits and risks would be found with greater integration involving harm reduction programs. For NSPs and other programs, service integration may require hiring of new staff members with appropriate training and qualifications. Peer workers may also play a role in directing and helping people access existing services in the community (Weaver et al., 2010). In short, there is much to examine regarding the integration between harm reduction programs and mental health services, and whether clients in different jurisdictions would benefit more from actual on site integration and/or stronger referral systems and partnerships.

Stigma, trauma, and people who use drugs

We know from some studies that mental health issues may impact interest and entry into substance use treatment among NSP clients (Havens et al., 2007; Kidorf et al., 2010; Peirce et al., 2013), but knowledge is more limited regarding factors that impact seeking mental health services among this population. However, we can reasonably extrapolate from available literature that stigma related to mental health may be a factor. People with mental health disorders often experience stigma from society at large, including healthcare providers (Brener et al., 2014; Dinos et al., 2004; Mackenzie et al., 2014; Rose et al., 2012). Such experiences and/or the anticipation of negative experiences may discourage people from seeking mental health services. Illicit drug use, particularly injection drug use, and living with HIV and/or hepatitis C are also highly stigmatized (Brener et al., 2014; Calsyn et al., 2004; Habib & Adorjany, 2003; Olsen & Sharf-

stein, 2014; Paterson et al., 2007; Rose et al., 2013; Wolitski et al., 2009). Thus, people who use drugs in ways that increase the risk of blood-borne virus transmission and suffer from a mental health disorder(s) may experience double or overlapping stigma, and in turn this may prevent them from accessing multiple services. This is an especially important consideration for harm reduction service providers to be aware of and integrate into their practices by, for example, developing an understanding of local experiences of stigma and discrimination, and stigma-reduction initiatives. Mental health and addiction services in Canada have been working towards reducing stigma and efforts have included community education (e.g., Wild et al., 2014).

Trauma is another key consideration when working with people who use drugs. Many NSP clients report histories of or re-exposure to trauma and drug use as a way to help deal with the physical, emotional, or psychological pain from trauma (MacNeil & Pauly, 2011; Peirce et al., 2014). Clients appreciate receiving non-judgemental and non-stigmatizing services at spaces where they feel valued and safe, and that serve as entry points to other services (MacNeil & Pauly, 2011). In addition to stigma awareness, staff at harm reduction programs who may be working with clients who have mental health issues and/or are providing information or referrals to mental health services may want to familiarize themselves with local trauma-informed services and learn how to incorporate trauma awareness into their own practices. The Trauma-Informed Practice Guide developed in British Columbia (website information below) is a useful resource that discusses the importance of understanding the linkages between trauma, mental health, and substance use when working with clients and describes the principles and practices of trauma-informed services.

Further examples and resources related to mental health and addiction services in Canada

See the Centre for Addiction and Mental Health (CAMH) website for information and numerous resources: www.camh.ca

Gap Analysis of Public Mental Health and Addictions Programs (GAP-MAP) Final Report from Alberta: www.health.alberta.ca/documents/GAP-MAP-Report-2014.pdf

Trauma-Informed Practice Guide developed on behalf of the BC Provincial Mental Health and Substance Use Planning Council: http://bccewh.bc.ca/wp-content/uploads/2012/05/2013_TIP-Guide.pdf

Mental health services referrals evidence summary

The evidence that informs this chapter and its recommendations came from mostly observational studies such as cross-sectional and prospective cohort studies. Cross-sectional studies in particular contributed information about prevalence of mental health issues, risk behaviours, stigma, and service use among people who use drugs.

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11

Housing services referrals



RECOMMENDED BEST PRACTICE POLICIES to increase access to housing services for people who use drugs:

- Educate clients about housing service options
- Refer clients to housing services in the community
- Establish and maintain relationships with a variety of agencies providing housing services, in particular those with experience working with people who use drugs
- Evaluate and publish any referral initiatives undertaken

Providing referrals to housing services

To improve overall health and well-being, harm reduction programs, such as needle and syringe programs (NSPs), can play a role in helping clients access services and programs that address housing. Programs based on harm reduction principles, such as the Housing First model discussed below, are designed to meet the needs of people who use drugs and are considered to be best practice. Harm reduction programs and housing services can have different types of referral processes between them (see case studies in Gaetz et al., 2013), although the full extent to which NSPs and other programs throughout Canada refer clients to housing services is unclear. Empirical literature that specifically addresses referral relationships between harm reduction programs and housing services is lacking. More research and evaluation on these kinds of referrals is needed to fill this gap.

A useful resource containing information about homelessness, particularly in the Canadian context, is www.homelessnesshub.ca. This website provides links to many resources and covers a wide range of topics related to homelessness including substance use, mental health, employment and training, population-specific issues, and service provision.

Evidence of housing instability and related health issues among people who use drugs

Housing status is not fixed; it can change over short and long periods of time. As well, housing status varies from stable (e.g., home ownership or rental), to numerous forms of insecure or unstable housing (e.g., staying in temporary shelters, staying at someone else's place, single-room occupancy hotels or "SRO hotels," "couch surfing"), to absolute homelessness (e.g., living/sleeping outdoors, in cars, in stair-

wells and unauthorized buildings). Analyses of Phase 2 data collected between 2005 and 2008 for the I-Track study – a large cross-Canada survey of people who inject drugs – reported that 41.4% of participants lived in unstable housing at the time of the interview and 60.8% did so at some point in the six months prior to the interview (Public Health Agency of Canada, 2013). The prevalence of housing instability varied across Canadian cities, with the highest proportion of those living in unstable housing in Victoria (63.6%) and the lowest proportion in Thunder Bay (11.8%; Public Health Agency of Canada, 2013). More recent (Phase 3) I-Track data collected between 2010 and 2012 revealed a lower prevalence of unstable housing (38.7%) at the time of the interview and a higher proportion of men reported living in unstable housing (Public Health Agency of Canada, 2014; Tarasuk et al., 2013). A Toronto study that recruited 1,191 participants from shelters and meal programs found that 60% (n=712) reported a lifetime prevalence of regular drug use while 40% (n=475) reported drug use within the last 30 days (Grinman et al., 2010). These rates were reported to be much higher than the general population (Grinman et al., 2010).

Homelessness and housing instability are associated with many negative consequences. For people who use drugs, being homeless or unstably housed is associated with increased risk of death, suicide, HIV and hepatitis C risk behaviours and infection, re-initiation into injection drug use, sexual risk behaviours, physical injuries, visits to hospitals and emergency departments, and mental health issues (Co-ady et al., 2007; Corneil et al., 2006; Des Jarlais et al., 2007; Elifson et al., 2007; Kim et al., 2009; Linton et al., 2013; Palepu et al., 2001; Roy et al., 2004; Shannon et al., 2006). People who inject drugs and lack stable housing are more

likely than others to report using drugs in public and/or unhygienic locations (e.g., alleys, stairwells) and to rush their injecting to avoid being caught by police or victimized by others (Bayoumi et al., 2012; Cooper et al., 2005; Gibson et al., 2011). Many I-Track Phase 2 participants (23.3%) reported injecting drugs most often in public places (Public Health Agency of Canada, 2013). I-Track Phase 3 data indicate that 39.4% of all participants injected drugs in a public place at some time in the six months prior to the interview, with significantly more men (41.8%) than women (34.3%) reporting having injected in a public place (Public Health Agency of Canada, 2014). Research also shows that people who are homeless or unstably housed are three to nine times more likely to be HIV-positive than those with stable housing, and that such elevated HIV rates are linked with substance use in general, injection drug use, and unprotected sex (Wolitski et al., 2007).

Youth represent a specific population worth highlighting in terms of substance use, homelessness, and other service needs. High proportions of street-involved and homeless youth have problems with alcohol and/or drug use (Barnaby et al., 2010; Kerr et al., 2009), and also have higher rates of mental health issues and suicide (see studies reviewed by Kirst & Erickson, 2013).

In a study with participants from Providence, Rhode Island, Stein and Friedmann (2002) examined perceived and unmet service needs of HIV-negative people who inject drugs and who were either not receiving drug treatment (n=251, recruited from an NSP) or were receiving drug treatment (n=312, recruited from a methadone maintenance treatment [MMT] program). Sixty-nine percent of participants stated that they had service needs that were unmet. Significantly greater service needs were reported for housing services by NSP clients than MMT clients (45.6% versus 24.1%, respectively). A study of 105 NSP clients from Victoria – more than half of whom were homeless and another 10% were living in shelters – found that “having a place to stay” was a common worry among this group (Exner et al., 2009). Housing is also linked with access to health care. Among people who inject drugs, those with stable housing are more likely to access HIV treatment and achieve viral suppression (Knowlton et al., 2006).

Housing First

Housing First is a recovery- and rights-oriented approach based on commitment to providing people with housing first and then following up with services for physical and

mental health, substance use, education, employment, and other areas as needed. The five core principles of Housing First are:

- 1) Immediate housing access without requiring people to first demonstrate that they are “ready” for housing
- 2) Client choice and self-determination (e.g., clients should have some choice regarding the type and location of housing)
- 3) Supporting recovery by ensuring that people have access to a range of supports
- 4) Having supports that are individualized and client-driven
- 5) Facilitating social and community integration (e.g., providing housing models that do not isolate clients; see Gaetz et al., 2013 for more detail about each principle).

In relation to the first principle, people who use drugs do not have to show that they are, for instance, interested in abstinence, already abstinent, “recovered,” or compliant with treatment services in order to obtain and maintain housing. This stands in contrast to more traditional housing/shelter models that require clients to show that they are abstinent or treatment-compliant to be selected for housing – models that also sometimes discharge clients from housing if they use drugs or alcohol. Under Housing First, some people may choose abstinence-only housing as their preferred living model (Gaetz et al., 2013), but it remains key that clients are presented with housing choices and, again, do not have to demonstrate a certain level of “readiness” (i.e., having received health care or other treatment services) for housing.

Housing First principles have been applied in different ways across Canada and elsewhere with use of varied housing models and types of support (Gaetz et al., 2013). In a commentary, Pauly et al. (2013) discuss Housing First as an example of housing and harm reduction integration. These authors identify four important areas for creating policy frameworks that combine harm reduction and housing initiatives:

- 1) Developing social inclusion policies (e.g., acknowledging needs of women, youth, and Aboriginal people)
- 2) Housing supply, including the availability of affordable housing and client choice
- 3) Having “on-demand” harm reduction services
- 4) Adequate organizational infrastructure (e.g., commitment to harm reduction in mission statements, staff training, and community education).

In a report about Housing First in Canada, Gaetz et al. (2013) summarized literature that shows that the approach is both effective and cost-saving, especially when compared to “treatment as usual” approaches that place homeless people in emergency services and other types of supported living settings until they are deemed “ready” for independent living or until housing becomes available. The “At Home/ Chez Soi” project has provided a wealth of evidence about Housing First (see final report by Goering et al., 2014). Funded by the Mental Health Commission of Canada, At Home/ Chez Soi was a randomized controlled trial that for two years followed participants recruited from shelters or the streets in five cities (Vancouver, Winnipeg, Toronto, Montreal, and Moncton). Of the 2,148 participants enrolled in the study, 1,158 received a Housing First intervention. The other half of the sample received treatment as usual that entailed access to existing housing and supports in their communities. Upon trial entry, 67% of the sample reported substance use problems (also, 71% reported a non-psychotic mental health disorder, while 34% reported a psychotic disorder). Two-year study follow-up rates were high, between 77% and 89%, given the transient nature of the population. A key finding is that those who received Housing First obtained and retained housing at much higher rates than the treatment as usual comparison group. Improvements in both mental health and substance use issues were observed, but the changes were similar for participants in both groups. Goering et al. (2014) provide a few possible reasons for this finding, namely that recovery is a long process that involves learning how to manage symptoms. Provision of housing and other services is key to the recovery process, but does not guarantee that major improvement will rapidly follow. The recovery process may have started for many participants during the study timeframe of two years, but this timeframe might not have been long enough to observe sustained improvements and potential differences between participants in the two intervention groups.

Considerations regarding substance use treatment in relation to housing

The relationships between substance use, treatment, and housing are complex and some studies have shown varied findings. According to Palepu et al. (2010), severe substance use was relatively low among participants in previous Housing First studies and more recent studies have reported some positive outcomes among homeless people with alcohol problems without mention of other drug use. Palepu et al. (2010) selected and examined data from 992 people

who inject drugs and were part of the prospective Vancouver Injection Drug User Study. Of this selected sample, 49.9% (n=495) were homeless and 50.1% (n=497) lived in SRO hotels. During the follow-up period between December 2005 and April 2010, 21.3% (n=211) attained stable housing (defined in this study as living in an apartment or house over two consecutive interviews during the follow-up timeframe). Analyses showed that receiving substance use treatment (varied treatment modalities) was negatively associated with obtaining stable housing. Palepu et al. (2010) stated that this finding may suggest that accessing substance use treatment is an indicator of “life instability” as frequent drug use was common among participants. Exposure to substance use treatment may not have reduced drug use enough for participants to be able to access stable housing.

Social living arrangement may also be a factor worth considering in relation to substance use, housing, and drug treatment. A study by Lloyd et al. (2005) examined social factors associated with entry to opiate agonist treatment among people who inject drugs and attended the Baltimore NSP. They found that compared to people who lived alone, in controlled, or non-stable environments (e.g., on the streets, abandoned houses, transitional housing), people who lived with a sexual partner were three times more likely to enter drug treatment. Also compared to those who lived alone, in controlled, or non-stable environments, those who lived with family or friends were nearly three times more likely to enter drug treatment.

It is also worth mentioning that low-threshold services developed for people with severe alcohol use who are marginally housed include managed alcohol programs (MAPs). MAPs are often coupled with supportive accommodation or housing and often clients come to MAPs through shelters and other referrals. These programs dispense regulated doses of alcohol to help clients stabilize and reduce alcohol-related and other harms (Muckle et al., 2012; Stockwell et al., 2013). Evaluation research on MAPs in Canada is underway (see www.carbc.ca/ResearchProjects/MAP.aspx) which will provide more information about how MAPs operate and link with various other services.

Other considerations

There are other ways that harm reduction programs can assist unstably housed clients. For example, McNeil et al. (2012) conducted a qualitative interview study with professionals involved in provision of health and end-of-life care

services to homeless and unstably housed people in Halifax, Ottawa, Hamilton, Toronto, Thunder Bay, and Winnipeg. The authors explored how harm reduction programs can act as a “point-of-entry” and source of support and end-of-life care to homeless and unstably housed people who use alcohol and/or drugs. Participants explained a number of ways in which harm reduction services can offer alternative supports and facilitate referrals to end-of-life services for their homeless and unstably housed clients (e.g., engaging with clients over time, maintaining relationships with palliative care providers, providing support to those who wished to “die at home”; McNeil et al., 2012).

Further examples and resources about housing-related services, plans, and needs in Canada

At Home/Chez Soi information and resources. www.homelessshub.ca/solutions/housing-first/homechez-soi

Calgary Homeless Foundation. <http://calgaryhomeless.com/>

Manitoba Housing and Community Development. Strong Communities: An Action Plan. www.gov.mb.ca/housing/pubs/hcd_strategicframework_web.pdf

Pauly B, Reist D, Schactman C, Belle-Isle L. Housing and Harm Reduction: A Policy Framework for Greater Victoria. University of Victoria, Centre for Addictions Research of BC; 2011. www.homelessshub.ca/resource/housing-and-harm-reduction-policy-framework-greater-victoria

See case studies from across Canada in Gaetz S, Scott F, Gulliver T. Housing First in Canada: Supporting Communities to End Homelessness; 2013. www.homelessshub.ca/sites/default/files/HousingFirstInCanada.pdf

Housing services referrals evidence summary

The evidence that informs this chapter and its recommendations came from mostly observational studies. Both cross-sectional and prospective cohort studies have contributed much information about associations between housing/homelessness, health, and risk behaviours. There have been different types of Housing First interventions, though a large Canadian one we refer to here was a randomized trial (i.e., the At Home/Chez Soi project).

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12

Relationships with law enforcement



RECOMMENDED BEST PRACTICE POLICIES to develop and maintain collaborative relationships with law enforcement to help ensure consistent availability of harm reduction services:

- Include law enforcement agents as one of the stakeholder groups to be engaged and informed when developing harm reduction programs
- Establish and sustain methods for ongoing communication between harm reduction programs and local law enforcement agencies
- Provide in-service training to law enforcement agents focusing on:
 - The purpose and goals of harm reduction programs
 - Evidence-based approaches to needle and syringe program (NSP) effectiveness, especially with regard to any impacts on community safety and public order
 - Needle-stick injury prevention and the basics of HIV, hepatitis C (HCV), and other pathogen transmission
 - The health and social concerns of people who use drugs
 - Evidence concerning the impacts of needle/syringe and other injecting equipment (e.g., cookers, filters) distribution for people who inject drugs
 - Evidence concerning the impacts of safer smoking equipment distribution for people who smoke crack cocaine
- Develop agreements with law enforcement to ensure that:
 - Clients can enter and exit from harm reduction program fixed sites or vehicles without police interference
 - Safer injection, safer smoking equipment, and overdose prevention kits (e.g., naloxone) distributed by programs are not destroyed or confiscated from clients by police
 - Fixed, mobile, and other sites (e.g., pharmacies) are not used for police surveillance purposes
- Establish a conflict resolution protocol to address concerns that may arise between harm reduction programs and law enforcement. Adverse client-police encounters should be documented and brought to the attention of law enforcement authorities

This chapter aims to give harm reduction programs information that they can use to develop productive relationships with local law enforcement. A recent briefing paper from the International Drug Policy Consortium (Monaghan & Bewley-Taylor, 2013) notes that:

[O]ver the last twenty-five years or so an increasing number of police services from countries around the world have devised and implemented policies and practices that have specifically supported increasingly widespread harm reduction policies and practices aiming to prevent, halt and reverse HIV and hepatitis B and C (HBV and HCV) epidemics amongst [people who inject drugs] and their sexual partners. (p. 2)

This chapter summarises evidence from Canada as well as international jurisdictions that have some experience with addressing various issues between harm reduction services, particularly NSPs, and law enforcement. While Canadian harm reduction programs have at times encountered difficulty establishing and sustaining relationships with law enforcement, this is not always necessarily so. It is important to keep in mind that these relationships are complex, evolving, and in need of ongoing communication.

Evidence of policing activities that create health and safety risks for people who inject drugs

Law enforcement activities can have negative impacts on the health and safety of people who inject drugs and can be problematic with respect to the operation of harm re-

duction programs. Activities include “crackdowns” and enhanced surveillance of drug-using areas and the arrest, detention, and harassment of people who inject drugs, including confiscation of drug use equipment. Evidence regarding these types of activities and related effects will be reviewed below.

Police crackdowns and enhanced surveillance

Police crackdowns and enhanced surveillance of drug-using areas can shift local drug scenes and increase people’s anxiety about getting caught by police. This can have the following effects for people who inject drugs: injecting in less safe spaces (e.g., alleys, parks), less contact with health and social services (including drug use equipment distribution programs and consequently less equipment acquisition), improper disposal of injection equipment, and rushed or unsafe injecting practices. These types of behaviours can undermine the efforts of harm reduction programs to reduce injection-related harms.

In 2003, a large-scale police crackdown to reduce illicit drug use in Vancouver’s Downtown Eastside (DTES) was examined to determine its impact on injection drug use behaviour (Wood et al., 2004). Information concerning drug use, risk-taking behaviour, access to healthcare services, and perceived effectiveness of law enforcement efforts on the supply of drugs was gathered from 244 people who injected drugs in the three months before the crackdown and from 142 people who injected drugs in the three months after the beginning of the crackdown. People who inject drugs reported that police presence led to significant changes in the public location of drug use (i.e., changes in the neighbourhood or alley used) and a marginal increase in public drug use (i.e., in a park, public washroom, or street). Additionally, people who inject drugs reported less contact with street nurses. Although the number of used needles found on the streets of the DTES core decreased significantly after the crackdown, there was a significant increase in improper needle disposal outside this core area, as well as a significant decrease in the use of safer disposal boxes located in the community. There was also a significant reduction in the number of needles returned to Vancouver’s largest NSP. An ethnographic investigation of the same crackdown in Vancouver found similar results (Small et al., 2006b). Thirty people who inject drugs and 9 service providers reported that the drug market in the DTES became less centralized and more diffuse, and more people were injecting in private indoor locations or in less visible outdoor spaces. People who would inject in outdoor locations such as alleys were

anxious about being interrupted by police and the anxiety would distract from the injection preparation process or lead to faster injections (Small et al., 2006b). Enhanced police presence in the neighbourhood deterred some people who inject drugs from accessing new syringes and carrying syringes out of concern about police scrutiny. Some people were displaced to areas where syringe distribution was more limited. Service providers also noted that it became harder to make outreach contact as drug use activity shifted away from where services had been provided prior to the intensified police presence.

International studies have documented similar impacts of enhanced police activity on drug scenes and safer injection practices. Between August and December 2000, Cooper et al. (2005) interviewed 40 people who inject drugs in the Bronx, New York City, to determine how a police crackdown affected their drug use behaviour. Increased police surveillance of public spaces and the elevated chance of being stopped by police were the two main factors that hindered use of safer injection methods. Some people who injected in public spaces reported rushing to inject so they would not be caught by police. Others reported choosing to inject outside instead of returning home through police-monitored areas after purchasing drugs. Several participants skipped cleaning their skin prior to injecting to save time. People who inject drugs also reported carrying drugs in their mouths so that, if approached by police, they were ready to swallow the drugs to avoid arrest. This action compromises sanitary injecting and puts people at risk of overdosing. Since needles could not be safely hidden on their person, participants hid needles around the neighbourhood’s public spaces. This action put people who inject drugs at risk of unknowingly exposing themselves to infection if others found and used the hidden needles, or if others removed hidden needles, which might have encouraged the original owner to reuse someone else’s needle.

In a study from Philadelphia, Pennsylvania, changes in NSP use were examined over a period of nine months before and after the initiation of an intensive long-term police intervention to deter drug activity (Davis et al., 2005). The crackdown involved uniformed police officers standing on targeted corners, many of which were in close proximity to NSP sites. Although the police intervention effectively reduced the occurrence of drug trafficking on the targeted corners, it was significantly associated with a reduction in the use of the NSPs, particularly among Black and male clients. Davis et al. (2005) suggested that reductions in NSP use might lead former NSP clients to share and reuse needles.

Aitken et al. (2002) qualitatively studied how a police crackdown affected the lives of people who inject drugs and drug dealers in Melbourne, Australia. People who inject drugs reported that the crackdown made it more difficult to obtain drugs, but the effect on the overall market was minimal and temporary. The crackdown resulted in a displacement of drug dealers from the streets into locations such as coffee shops where police activity was less intense. Some people who inject drugs resorted to injecting alone in alleys, thus decreasing their chances of being found if an overdose were to occur. One participant reported using a friend's old needle due to feeling uncomfortable walking past police who were standing opposite the local NSP. In another Australian study, Maher and Dixon (1999) consulted with 143 current heroin users in Cabramatta, an area of Sydney known for heroin use, to determine the impact of several intensive policing interventions that took place during this time. During police anti-drug initiatives, people who inject drugs reported being more reluctant to carry injection equipment, with some reporting either picking up used needles on the street or borrowing them from friends.

Arrest, detention, and harassment including equipment confiscation

Routine police practices involving people who inject drugs in and around harm reduction programs have had effects on program access and risk behaviours similar to those resulting from intensified police activity. Using data from a qualitative study of 15 Ontario NSPs, Strike (2001) reported that NSPs have been subject to police surveillance that discouraged clients from attending fixed sites; related actions included police following NSP vehicles around the community, detaining clients exiting NSPs, and confiscating equipment obtained from NSPs from clients. In a report based on consultations with nearly 50 key informants in Quebec (including NSP clients, community stakeholders, and representatives from public health and the police), Noël et al. (2012) reported that NSP clients feared police questioning, arrest, and harassment near NSPs. Client concerns about having their needles confiscated led some to carry fewer needles, reuse injecting equipment more often, and not return their used needles to NSPs. Davis et al. (2005), in a US study noted above, found that NSP clients reported numerous cases of police harassment and at least one client was arrested for possession of needles received at the NSP site. In their Australian study, Maher and Dixon (1999) found that some participants had their needles destroyed by the police or were forced to destroy their own needles. Additionally, some participants in that study reported swallowing heroin they had

stored in their mouths to avoid being caught with drugs by police, which led to several near-fatal overdoses.

In a study of 465 people who inject drugs in Vancouver, 130 (28%) reported being detained by police without arrest in the past six months (Werb et al., 2008). In multivariate analysis, factors associated with being stopped, searched, or detained by police included homelessness, recent incarceration, frequent crack cocaine use, requiring help with injecting, and lending syringes (Werb et al., 2008). Among participants who had been detained by police, 34% said that they had their drugs confiscated and, among this group, 70% immediately obtained new drugs. Also among participants who had been detained, 51% reported having syringes confiscated by police. Among this group, 47% immediately obtained new syringes from a distribution program, 11% bought new syringes, and 6% immediately borrowed used syringes. Ti et al. (2013) examined questionnaire data from 991 participants from the prospective cohort At-Risk Youth Study (ARYS). In multivariate analyses, factors significantly associated with being “stopped, searched, or detained by police without arrest” included being male, homelessness, recent incarceration, daily cannabis use, daily heroin injecting, crack pipe or syringe sharing, any injection drug use, public drug use, sex work, and drug dealing (Ti et al., 2013). Out of the 991 participants, 188 (19%) reported having their drug use equipment taken from them without arrest and 167 (17%) reported experiencing violence from police during the study period.

Outside of Canada, the US, and similar developed countries, varied policing activities have also had negative effects on drug-related risk behaviours including shortcuts in hygiene practices, rushed injections, and syringe sharing (e.g., in Russia, Sarang et al., 2008; in Mexico, Volkmann et al., 2011). It should also be noted that fear of arrest or negative interactions with the police is often a reason why people who use drugs may not call 911 in the event of an overdose (Davidson et al., 2002; Pollini et al., 2006; Sherman et al., 2008; Tracy et al., 2005). Such fear may also interfere with naloxone administration (Worthington et al., 2006). This barrier to obtaining health services in the event of a medical emergency is of concern, particularly for people who inject drugs like heroin or other opioids.

Groups at higher risk of police interference

Two studies have shown an association between race and the policing of harm reduction programs and their clients. Beletsky et al. (2011c) conducted a cross-sectional survey

of NSP managers in the US; 111 programs from 34 states and territories participated. The legal environment in which these programs operated varied. Forty-three percent of managers reported clients being harassed by police at least monthly (23% at least weekly and 11% at least daily; Beletsky et al., 2011). NSP managers also commonly reported “unauthorized confiscation of clients’ injection equipment.” Thirty-one percent of respondents reported that this happened at least monthly, 13% at least weekly, and 6% daily. Twenty-eight percent reported arrests of clients on their way to or from a program at least once or twice a year and 12% reported uninvited police appearances once or twice a year. Analysis also revealed that serving primarily non-white (African-American or Hispanic) clients was independently associated with reports by managers of unauthorized confiscation and client arrest on their way to or from an NSP.

A social mapping study showed that women engaged in street-level sex work in Vancouver avoided health and syringe distribution services due to recent violence and local policing, including police presence and harassment (Shannon et al., 2008). Within this group, younger and Indigenous women, women who inject drugs, and women who smoked crack cocaine daily were more likely to avoid these services (Shannon et al., 2008).

Evidence of policing activities that create health and safety risks for people who smoke crack cocaine

In comparison with literature that has examined policing impacts on people who inject drugs and the programs that service their needs, fewer studies have examined impacts on people who smoke crack cocaine. Nonetheless, some literature has documented experiences with police encounters among this group. Using data from two prospective cohort studies from the Greater Vancouver area, Ti et al. (2012) found that out of 914 people who smoked crack cocaine and completed study follow-up, 33% had experienced difficulty accessing crack pipes. In a multivariate analysis, noticing police presence where drugs are bought or used, among other characteristics such as sex work involvement and crack pipe sharing, was independently associated with difficulty accessing crack pipes (Ti et al., 2012). In their study of safer crack use kit distribution in Victoria, British Columbia, Ivins et al. (2011) noted that after the closure of the city’s only fixed-site NSP, local police “conducted more aggressive law enforcement and policing against street drug users” (p. 294). Interviews were conducted with 31 people who smoke crack cocaine and participants reported that police interference

was one of the main barriers to safer crack kit distribution. Nearly half of the participants discussed having had pipes confiscated or broken by police. Further, some expressed concern about carrying pipes as they had a bail or probation order that required not being in possession of drug use equipment. Incidents where police confiscated and/or broke pipes obtained from safer crack cocaine smoking programs have also been reported in Vancouver (Johnson et al., 2008), Toronto (Hopkins et al., 2012), and Ottawa (Leonard, 2010; Leonard et al., 2006).

In Ontario, it has been noted that opposition to safer crack cocaine smoking equipment has been much stronger in Ottawa than in Toronto (O’Byrne & Holmes, 2008); elsewhere it has been reported that Ottawa’s police have not supported safer crack kit distribution (Garmaise, 2005, 2007). In the final evaluation of Ottawa’s Safe Inhalation Program (SIP) – a program that distributes safer smoking equipment – it was reported that police surveillance had occurred at SIP partner agencies, around the safer inhalation van, and in the community, and that this surveillance and fear of police deters some people from accessing services (Leonard, 2010). The same evaluation also indicated a significant increase among participants who smoke crack cocaine who reported that they discarded their stems in public places (e.g., streets, parks) because they were “worried about being caught by police with the stems on them.” Forty-three percent of participants reported this issue two months post-program implementation and 69% reported it 11 months post-program implementation.

The Canadian HIV/AIDS Legal Network (2008) has stated, “The police lack legal authority to destroy arbitrarily someone’s personal possessions. A police officer crushing a crack pipe underfoot would violate this principle” (p. 5). The Legal Network (2008) also noted that police might be able to arrest someone they see with a crack pipe, in a situation that is consistent with drug use, on reasonable grounds of cocaine possession, and that police could lawfully seize a crack pipe from someone they are arresting. People who smoke crack cocaine in public have reported willingness to use supervised smoking facilities, and this willingness was associated with having police encounters (DeBeck et al., 2011; Shannon et al., 2006). In the Toronto and Ottawa Supervised Consumption Assessment (TOSCA) study, some of the most common reasons reported by people who smoke crack cocaine for why they would use a supervised smoking facility included being away from police and to be safe from crime (Bayoumi et al., 2012). At the time of preparing this document, there was no legally sanctioned supervised smoking facility in Canada.

Evidence of cooperative relationships

While literature from Canada and elsewhere has highlighted significant challenges that characterise the relationships between law enforcement and harm reduction programs and their clients, it is important to recognise that not all of these relationships are negative and that these relationships can change and improve over time. Increased police presence, for example, may not always translate into greater harms. Small et al. (2012) – using observational data, interviews, and supervised injection facility (SIF) utilisation statistics – reported that despite elevated police presence in Vancouver's DTES during the 2010 Olympics, people who inject drugs continued to access health services during that timeframe. Unlike what had been observed during the Vancouver crackdown in 2003, the local drug markets did not undergo major displacement and no cases of syringe confiscation or deterrence from visiting harm reduction programs were documented. Small et al. (2012) noted that the local police developed a departmental drug policy that frames drug use from a health perspective, encourages practices that allow people to access harm reduction programs, and stresses “discretionary application of the law” (p. 132) in relation to possession and consumption of drugs in the DTES.

Other examples have provided valuable lessons about how to identify and encourage cooperative relationships. In Quebec, consultations revealed that some NSPs and local police (both in urban and non-urban areas) have formed productive partnerships whereby these agencies have regular contact with each other to coordinate and help improve practice (Noël et al., 2012). Examples of community-level collaboration included police carrying injection equipment disposal bins in their cars to help collect and return used equipment; police referring people who inject drugs to NSP services; community organizations educating police about their role in HIV prevention; and committees and working groups set up to work with police, community, and NSP stakeholders (Noël et al., 2012). Small et al. (2006a) argued that a “culture change” occurred in terms of public and government agency support that enabled the establishment of Vancouver's SIF, including some police officers who showed support despite overall strong police opposition. Based on analysis of data from 1,090 people who attended that SIF, DeBeck et al. (2008) found that 182 (nearly 17%) participants were referred to the SIF by police. In multivariate analysis, factors independently associated with being referred to the SIF by police were sex work, frequent cocaine injection, and unsafe syringe disposal. DeBeck et al. (2008) suggested that the SIF provides local police with a tool to promote public order

and safety objectives. It should be noted that these examples are from Vancouver, a city unique in Canada because of a concentrated drug market in the DTES, and its municipal response which framed the situation as a public health crisis (see MacPherson et al., 2006).

Developing protocols and training

Literature concerning how to go about ensuring that law enforcement agencies do not negatively impact harm reduction service goals is limited, but does suggest some possible strategies to develop positive relationships between programs and police. Having a conflict resolution protocol (that includes, for example, a system for recording and communicating adverse events) will serve to enhance the overall accountability and integrity between harm reduction programs and law enforcement.

Collaboration between harm reduction programs and police may improve police understanding of the need for harm reduction services and their associated public health benefits. Collaboration means that law enforcement and harm reduction programs work together to develop strategies to reduce negative health and social effects of drug use while, at the same time, allowing police officers to enforce the law. Efforts to develop and sustain working relationships can include police training and other measures that aim to reduce the “misinformation and fear” that often characterises police perceptions of people who inject drugs (Beletsky et al., 2005).

In their report about police interventions on NSP use within the Quebec context, Noël et al. (2012) recommended the following actions for building productive and collaborative relationships:

- Develop working groups and establish regular information-sharing meetings to facilitate communication
- Use approaches that are integrated, coordinated, diversified, and innovative – with stakeholders conducting their work together as a network rather than in isolation
- Determine the appropriate course of action for when police need to intervene inside or near an NSP, and outline an approach to conflict resolution
- Involve all stakeholders including NSP users
- Reinforce the role of community-liaison police because they promote links between police and the community
- Achieve support from higher levels within police associations on NSP-related issues
- Have public health authorities take a leadership role

Insight from NSP workers has suggested that it is helpful to encourage the Medical Officer of Health and/or the Executive Director of a community organisation to speak directly with the local Chief of Police about a harm reduction program, its goals and procedures, and how the program and police will or will not interact (Strike, 2001). From the same qualitative study, Strike (2001) reported that police and NSPs sometimes interfere with each other's work. At the time of the study (late 1990s), most Ontario NSPs reported that their relationship with the local police was good, but some reported ongoing harassment of the staff and clients. NSPs that reported good relationships also reported that a police officer was a member of the advisory board and/or that the Medical Officer of Health and/or Executive Director of a community organisation had established a set of procedures and policies for the relationship between the NSP and the police. Participants noted that staff changes within an NSP and/or the police require that relationships between the two be revisited regularly.

Relationships between harm reduction programs and the police should be established as early as possible, including in the planning and development stages of a program. Somlai et al. (1999) reported that inclusion of law enforcement during the planning stages of the Milwaukee NSP, known as Lifepoint, greatly reduced opposition from law enforcement agents. Law enforcement personnel collected their information from enforcement agencies in other locations to develop guidelines and policies for working with the NSP. Local law enforcement adopted a neutral stance towards the NSP and agreed not to actively investigate the NSP or its clients.

Studies of training programs developed for police about harm reduction programs and basic disease transmission show mixed results. Beletsky et al. (2011a) examined a training intervention that involved a 30-minute oral presentation for Rhode Island police officers. Content included: description of and rationale behind public health programs and NSPs; evidence that NSPs and pharmacy access to syringes help reduce blood-borne infection transmission; evidence that NSPs may help reduce occupational needle-stick injuries; basics on how HIV, HCV, and other blood-borne infections are transmitted and prevention strategies; protocols for reporting and responding to needle-stick injuries; laws and procedures regarding drug enforcement activities; standards for when to consider syringe possession as probable cause for searches or evidence of illicit activity; and communicating the legality of possessing syringes to people who inject drugs during searches (Beletsky et al.,

2011a). Ninety-four officers participated in baseline and 78 officers participated in post-training survey assessment. At baseline, 51% of respondents reported that syringe access promotes drug use, while 58% and 38% said that it increases the chances of police needle-stick injury and fails to reduce disease, respectively. Only 7% of respondents correctly understood state syringe possession law. A large majority of the sample (92%) identified that HCV transmission would be the more likely risk from needle-stick injury, while only a minority (13%) knew that risk of HIV from such injuries is relatively low. Beletsky et al. (2011a) found that knowledge and beliefs improved only slightly after training, suggesting "entrenched cultural and professional beliefs" (p. 2014).

Similar training curricula have been used in Philadelphia, Pennsylvania, and Wilmington, Delaware (Davis & Beletsky, 2009). Training sessions were tailored for each city, though they were kept to less than 30 minutes, stressed occupational safety, and included local NSP members who answered questions and discussed the advantages of police and programs working together. Davis and Beletsky (2009) reported that none of the departments they approached refused to participate and pilot training was conducted with approximately 600 officers in the three cities. Overall, officers were fairly receptive to the information presented about NSPs and the authors concluded that "bundling" such information with strategies for enhancing occupational safety may increase receptiveness. Police officers are especially concerned about occupational needle-stick injuries (Beletsky et al., 2005; Davis & Beletsky, 2009; Noël et al., 2012). In a case study focused on the Wilmington experience, Silverman et al. (2012) reported meeting with the chief of police to discuss standard procedures regarding the handling and disposal of syringes, and to secure agreement for officers to participate in training. NSP staff delivered training that emphasised the public health goals of the NSP and instruction on occupational safety procedures regarding needle-sticks. After training with officers, the NSP director also secured permission from senior police management to train departmental staff on how to conduct the training.

In a survey of NSP managers, 107 programs (57% of US NSPs at the time) responded to questions about police training and of these 21 (20%) reported participation and 15 (14%) reported administering training (Beletsky et al., 2011b). In multivariate analysis, participation in police training was significantly associated with state-level exception allowing NSP clients to possess syringes without a prescription, more frequent client arrests to or from an NSP, and having a system to record adverse events. Beletsky et al. (2011b) noted that

programs experiencing adverse events may be more motivated to address issues through police training.

Silverman et al. (2012) have noted some limitations regarding training workshops, including the reality that officers' time to participate is limited and opportunities to involve an entire department are infrequent. Another potential issue is that police officers may not retain all of the information presented at training. To help with this issue, Silverman et al. (2012) developed wallet-sized cards to be given to police officers during training that contained information about avoiding needle-stick injury, NSP authorisation law, and a number that officers could call with questions or for NSP referrals.

More formal, published evaluations of police training initiatives are needed. Within the existing literature, it is difficult to recommend exactly how programs should design their police training or workshops; a "one-size-fits-all" approach for programs across jurisdictions in Canada may not meet the needs of all programs and local police departments.

In addition to police training, educating harm reduction program clients about their basic legal rights and how to interact with police is important for improving relationships. To reduce potential harassment and confiscation of harm reduction supplies, some NSPs distribute identification cards that state the individual is an NSP client (Millson & Strike, 2003). Some NSPs have negotiated a policy with police to ensure that officers will not confiscate needles and other materials from cardholders (Loue et al., 1995). However, some NSP staff have raised concerns that clients who are stopped by police in a situation unrelated to illicit drug use and are in possession of an NSP identification card may be subject to closer scrutiny and/or searches than is warranted by the situation for which they were detained (Strike, 2001).

Silverman et al. (2012) recommended that clients know what they should say, how to act, and where to direct questions to help mitigate potentially negative interactions with police. These authors created wallet-sized cards for NSP clients, staff, and attorneys with information about the law and a phone number to report negative incidents with police or for police to call to confirm the client's NSP membership. Further, Silverman et al. (2012) described "Know-Your-Rights" workshops developed for people who inject drugs. These hour-long sessions contained information on general street law, interacting with police, and legal benefits stemming from NSP membership. Programs might also consider implementing an incident-monitoring system, which may

include administering detailed questionnaires, keeping databases, and operating phone hotlines. This can be used to systematically document client experiences with police, develop warning systems, and produce data that can also assist police decisions (Silverman et al., 2012).

Sutton and James (1996) reviewed the work of various Australian law enforcement agencies; interviewed personnel in senior policy, management, and operational positions; assessed relevant criminal justice data; and formulated methods to help make Australia's drug law enforcement more rational and accountable. Based on their findings, it was recommended that policy statements specify how enforcement policy and practice meet the standards of harm reduction principles, outcomes such as expected reductions in illicit drug supply, and strategies to resolve conflicts between the goals of supply reduction and harm reduction. To implement these objectives and enhance the capacity of drug law enforcement agencies, it was recommended that drug law enforcement agencies engage in multi-sectoral collaborations to achieve an integrated approach to drug supply reduction and harm reduction, develop a shared understanding of harm reduction across agencies, and develop an integrated training strategy for police and other stakeholder agencies.

Law enforcement perceptions of harm reduction

Several studies have explored perceptions of harm reduction programs among police officers. Beletsky et al. (2005) interviewed 14 Rhode Island police officers and found that participants were:

- Typically unaware or misinformed about legal syringe purchase and possession. However, legal knowledge did not tend to alter their behaviour in street situations (e.g., police officers still treated syringes as contraband though syringe possession was legal).
- Anxious about accidental needle-stick injuries and did not receive training about this occupational risk.
- Frustrated with the criminal justice system's failure at deterring and modifying behaviours and structural barriers that contribute to drug use and crime.

In a qualitative study of police perceptions of supervised consumption facilities (including SIFs), Watson et al. (2012) suggested that police frame harm reduction programs as enabling drug use and addiction. Interviews and focus groups were conducted with 18 police officers and senior officials in Ottawa and Toronto. Some participants acknowledged

the benefits of longstanding harm reduction programs like NSPs, methadone maintenance, and outreach. The authors noted that these programs have not always been supported by police, suggesting that attitudes can change over time.

Negative perceptions about harm reduction can act as a significant barrier for program operation both at the street level and at higher, structural levels. According to Tempalski et al. (2007), resistance from law enforcement, local communities, and wider political forces translates into failure to initiate broad-scale harm reduction policy and programs. However, even in environments without legal syringe access, police may develop favourable views of harm reduction. In a study by Davis et al. (2014), 350 North Carolina law enforcement officers were surveyed about needle-stick injury, perceptions of blood-borne disease risk, and their attitudes toward syringe decriminalization (as state laws criminalize syringe possession and distribution for illicit drug use – see also the section on Variation in legal environments below). Eighty-two percent of the sample reported that acquiring HIV was a “big concern” to them. Approximately 63% agreed that syringe decriminalization would be beneficial for the community, while 60% reported that it would be “good for law enforcement”. A minority (3.8%) of participants reported ever experiencing an occupational needle-stick injury. Davis et al. (2014) stated a need for more data on these injuries among officers.

Crime and harm reduction programs

A limited number of studies have been conducted to evaluate the impact of NSPs and other harm reduction programs on crime in the surrounding neighbourhoods. Studies that have been conducted have tended to focus on drug-related offences, with less attention paid to violence and property crimes. Marx et al. (2000) examined arrest trends in Baltimore, Maryland, six months before and six months after the opening of two NSP sites in 1994. Although there was an increase in drug possession arrests in the program areas shortly after the opening of the NSP, findings indicated that drug-related arrests did not increase more prominently in NSP areas than in other sections of the city after the introduction of the program. The increased drug possession arrests were believed to be associated with police sweeps that occurred soon after program initiation. In terms of other types of harm reduction programs, research on crime around supervised consumption facilities and SIFs has reported some mixed findings. Data from Sydney, Australia, and Vancouver have suggested that SIFs are not associated with increased robberies, thefts, assaults, or vehicle break-

ins (Freeman et al., 2005; Wood et al., 2006). However, a study of 15 European supervised consumption facilities found that six facilities reported increases in drug dealing in the vicinity and three facilities reported aggressive incidents and increased petty crime nearby (Kimber et al., 2005). Canadian and international studies have not found increases in public order or safety problems near clinics offering heroin-assisted treatment (Lasnier et al., 2010; Ribeaud, 2004). A study conducted in Baltimore evaluated crime around 13 methadone treatment centres and, for comparison, 13 convenience stores, 13 residential points, and 10 hospitals (Boyd et al., 2012). Using a Baltimore police database, Boyd et al. (2012) found no significant change in crime counts as distance increased from the methadone treatment centres, suggesting that these centres are not geographically associated with crime. Overall, more research on the impact of harm reduction programs on public order is needed as community stakeholders and police are particularly concerned about these issues (Bayoumi et al., 2012; Watson et al., 2012).

Variation in legal environments

In Canada, the distribution and possession of new or unused needles is legal; elsewhere in the world, the legal status of syringe access varies widely. Beletsky et al. (2008) noted that a growing number of US states passed laws authorising NSPs, pharmacy syringe sales, or both. A number of city and county governments have authorised NSPs. Beletsky et al. (2008) suggested that state-level authorisation of NSPs is “optimal” because it legitimises the operation of a program for other agencies such as local police departments.

Martinez et al. (2007) examined self-reported data of people who attend NSPs in 16 counties in California. At the time, 11 of those counties had legalised NSP operation while five had not (under a law that authorised NSPs to ensure that workers would not be prosecuted). Across these counties, the possession of drug “paraphernalia,” including syringes, remained illegal for people who inject drugs. Martinez et al. (2007) found that compared to clients of illegal NSPs, clients of legal NSPs had higher odds of being arrested or cited for possessing drug use equipment over a 6-month period. The authors suggested that policing activities may have been more heavily concentrated around legal NSPs as these programs possibly became more visible as a result of being decriminalised; an increase in program visibility also likely increased the visibility of clients. Other evidence of overlap between NSP access and police arrest rates has come from geospatial analysis of New York City Health districts (Cooper et al., 2012). Districts with higher NSP access had higher

drug-related arrests which may have undermined the protective effect of NSP services. Cooper et al. 2012 also reported lower rates of injecting with non-sterile syringes in areas with lower drug-related arrest rates.

Gaps between written law or official policy and actual policing practices have been discussed in other international contexts, such as Mexico (Miller et al., 2008) and Vietnam (Jardine et al., 2012). Russia, in particular, has presented examples of policing practices that include rights violations such as extortion, brutality, and evidence planting (Sarang et al., 2010). However, in countries with traditionally strict law enforcement responses to drugs, notably a number of Southeast Asian countries, headway towards harm reduction policy has been observed (e.g., Sharma & Chatterjee, 2012; Thomson et al., 2012).

Evaluation of law enforcement practices and drug supply and use

Researchers and commentators have discussed how law enforcement practices have had limited success in terms of reducing drug supply and drug use (Strang et al., 2012). In a commentary about a heroin shortage in Australia, Wodak (2008) concluded that law enforcement may have had a modest contributing role to the reduction in drug supply compared to other factors such as decreased production. Wodak (2008) also provided examples of weak evidence used to support drug law enforcement measures. The author recommended that, like health interventions, enforcement practices should be held to a high standard of empirical evidence.

An American study by Friedman et al. (2006) examined the impact of arrests for cocaine or heroin possession, police employees per capita, and corrections expenditures per capita on population prevalence of injection drug use and HIV prevalence. Findings did not show a relationship between these three factors and the prevalence of injection drug use. The results did show that all three factors were associated with HIV prevalence. Friedman et al. (2011) investigated the hypothesis that higher rates of drug-related arrests would predict lower rates of injection drug use. The authors collected data on drug (i.e., cocaine and opiates) arrests from the FBI's Uniform Crime Reporting Program and estimated the number of people who injected drugs across the largest metropolitan statistical areas in the US from 1992 to 2002. Statistical analyses revealed that arrest rates did not predict changes in population rates of injection drug use. These findings challenge assertions that increasing drug-related

arrests deters people from injecting drugs. However, Friedman et al. (2011) noted that they only examined a small number of variables; further, it was not clear how many people arrested for hard drugs also injected drugs.

There is a wealth of Canadian and international literature that has questioned the utility of drug law enforcement practices, often noting how enforcement has led to large increases in incarceration, violence in illicit drug markets, harms to individual and public health, and marginalization of people who use drugs (e.g., Carter & MacPherson, 2013; Kerr et al., 2005; Room & Reuter, 2012; Werb et al., 2011). This literature is beyond the scope of this document.

Further readings and training materials

Canadian Centre on Substance Abuse (CCSA). Enforcement Overview and search CCSA's library for other resources regarding law enforcement: <http://www.ccsa.ca/Eng/Topics/Enforcement/Pages/EnforcementOverview.aspx>

Gouvernement du Québec (2014). Vers une meilleure cohérence des interventions en matière de santé et de sécurité publiques auprès des personnes utilisatrices de drogues par injection. Guide de prévention des infections transmissibles sexuellement et par le sang à l'intention des services policiers, des groupes communautaires et des établissements de santé et de services sociaux; 2014. Ministère de la Santé et des Services sociaux, ministère de la Sécurité publique. Accessed February 2015 from: <http://publications.msss.gouv.qc.ca/acrobat/f/documentation/2013/13-313-03W.pdf>

Harm Reduction International website for a collection of papers related to policing and harm reduction: <http://www.ihra.net/sub-catagories-policing-and-harm-reduction-illicit-drugs>

HIV/AIDS Asia Regional Program (HAARP). Law Enforcement and Harm Reduction Manual; 2009. <http://www.haarp-online.org/Publications/Resources.aspx>

Law Enforcement and HIV Network (LEAHN)'s website for a variety of resources including training material: <http://www.leahn.org/resources/>

The Foundation for AIDS Research (amFAR). Fact Sheet: Public Safety, Law Enforcement, and Syringe Exchange; 2011. http://www.amfar.org/uploadedFiles/In_the_Community/Publications/factsheetJan2010.pdf

Vancouver Police Department. Guidelines for Police Attending Illicit Drug Overdoses: <http://vancouver.ca/police/police-board/documents/0648DrugOverdosePolicy2006Jun14.pdf>

Online videos

California Department of Public Health, Office of AIDS. The Risks of the Job: Preventing Needle Stick Injuries to Law Enforcement. <http://vimeo.com/6599539>

Prevention Point Philadelphia. Sterile Syringe Access: Protecting Law Enforcement and the Community. <http://www.preventionpointphilly.org/policy/video.php>

Relationships with law enforcement evidence summary

Much of the evidence that informs this chapter and its recommendations came from qualitative and observational studies. Qualitative interview studies, which often sampled people who inject drugs, have contributed much knowledge regarding client encounters with police at and around harm reduction programs, and the impacts of routine and intensified police activity including increased client risk behaviours. Several qualitative studies have canvassed police perceptions of harm reduction programs and some studies have included an observational component. Cross-sectional and a few prospective cohort studies have also contributed to our understanding of interactions between police and people who use drugs, including impacts on risk behaviours. Further, these study designs have been used to explore program-police interactions and police training offerings via surveys of NSPs. We referred to some evaluative studies, predominantly reports from the grey literature on safer crack cocaine smoking programs. These reports contained qualitative components that contributed insights into interactions between police and people who smoke crack cocaine specifically. Given the nature of relationships with law enforcement, empirical study of these issues is not amenable to experimental methods.

Some studies used police data, particularly arrest data, to examine drug enforcement trends. Several case studies provided considerable detail on police training activities. Other study designs and materials (e.g., policy analysis, commentary) provided information for this chapter, but less frequently. While the evidence has grown in recent years, there remain notable gaps in the literature on relationships with law enforcement. Overall, detailed analysis of police trainings, related interventions, and well-designed evaluations of these are lacking. Such research would further assist Canadian harm reduction programs in how to set up their own protocols and interventions with local law enforcement.

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13

Education and other services for the prison context



RECOMMENDED BEST PRACTICE POLICIES to increase access to education related to the prevention of human immunodeficiency virus (HIV), hepatitis C (HCV), hepatitis B (HBV), and other pathogens, and to other harm reduction and support for prisoners who use drugs and those soon to be released from federal prisons or provincial correctional facilities (both contexts referred to as “prisons” below):

- Establish and maintain relationships with nearby prisons to develop and deliver in-reach education related to the prevention of HIV, HCV, HBV, and other pathogens
- Develop educational interventions that can be delivered by trained peers
- Provide prisoners with educational interventions in a variety of formats targeted toward reduction of injection-related risk behaviours (e.g., needle and other injection equipment reuse and sharing) associated with pathogen transmission and other drug-related harms
- Involve prisoners wherever possible in the design and evaluation of educational materials to ensure message acceptability, relevance, and comprehension. Tailor education for the populations and prisons served by the program, with special attention to the needs of women and Indigenous prisoners.
- Provide prison staff with educational interventions about harm reduction and basic HIV and HCV information (e.g., transmission)
- Refer prisoners coming up for release and newly released persons to a variety of community-based services including harm reduction programs (with emphasis on overdose prevention education) and other health and social services
- Evaluate and publish any initiatives undertaken

Why include recommendations for harm reduction in the prison context in this document?

Prisoners and people recently released from prison are at high risk for transmission of HIV, HCV, and HBV, particularly via injection drug use (Jürgens, 2007; World Health Organization [WHO], 2005). Prisons are thus important sites for education and prevention efforts. In Canada, a sizeable number of people who inject drugs have experienced incarceration. Participants in I-Track, a large cross-Canada risk behaviours surveillance study of people who inject drugs, were asked to report all of the places they had lived in the six months prior to the interview. Phase 3 data show that out of 2,683 participants, 11.5% had lived in a correctional facility (jail, corrections, prison) in the previous six months – with a significantly higher proportion of men (12.5%) reporting this form of unstable housing than women (9.3%; Public Health Agency of Canada, 2014). A large majority of all Phase 3 participants (82.5%) reported previous incarceration at some point in their lives.

This chapter focuses on ways that community-based organizations might provide harm reduction programming to

prisoners and those soon to be released from prison, in addition to health and other services offered by corrections. We focus on community-based organization outreach or (as some prefer the term) “in-reach” provision of HIV, HCV, and other prevention education to prisoner populations and correctional staff. Provision of these programs has notable advantages including improved service consistency and communication between correctional staff and educators (Dyer & Tolliday, 2009). These programs also offer another source of information to prisoners who typically do not have access to the internet and may experience issues related to security and trust with correctional staff.

Efforts to reach prisoner populations can be challenging given perceived incompatibility between the goals of reducing risk behaviours and the security and enforcement mandates of most prison systems (see WHO, 2005, 2007). Harm reduction service providers may confront many challenges accessing prisoners. Programs must also be modified to suit or be approved for correctional settings, and thus often differ in scope and delivery compared to services in the community. When community service providers are granted access, they may face additional challenges providing services to pris-

oners due to zero-tolerance drug policies and enforcement efforts inside. In particular, prisoners may feel reluctant to disclose to workers any current drug use due to fear of consequences. Limited funding for behavioural and educational interventions and lack of research on these interventions are issues as well (De Groot et al., 2006). Overall, we recommend that harm reduction programs be creative, flexible, and persistent in their efforts to deliver services that will help improve the health and conditions of prisoners who use drugs, as well as correctional staff and others. The evidence base regarding these programs is currently limited. Therefore we also recommend that community-based organizations evaluate their in-reach programs and publish findings.

Evidence shows that prison-based needle and syringe programs (PNSPs) are effective health services and help ensure that prisoners have access to the same standard of care as the general community (Abbing, 2013; Betteridge & Dias, 2007; Chu & Elliott, 2009; Kerr et al., 2004; Peate, 2011). In this chapter, we focus on in-reach to prisoners and do not provide recommendations for PNSPs for several reasons. Despite evidence of risk behaviours – discussed below – HIV prevention and harm reduction programs offered by correctional facilities in Canada are limited and, at the time of writing, do not include needle and syringe distribution. Best practice guidelines are available to assist PNSPs where they exist internationally (Stöver, 2014; see also WHO, 2007). Further, efforts to implement PNSPs and develop best practice guidelines for PNSPs in the Canadian context are underway (van der Meulen & Chu, 2015; see also www.prisonhealthnow.ca/). There is a strong need to continue to advocate for implementation of comprehensive prison-based harm reduction programming, including PNSPs, in Canada (Betteridge & Dias, 2007; Bollini et al., 2002; WHO, 2005).

Recognizing the ongoing need for comprehensive harm reduction programming in Canadian prisons, our focus in this chapter is on the relatively small body of evidence that suggests that community organizations are well-placed to provide in-reach education. We also briefly discuss education and referrals for people soon to be released from prison, particularly the need for overdose prevention education.

Prevalence of HIV and HCV in Canadian prisons

The federal prison system is operated by the Correctional Service of Canada (CSC), which oversees the administration of sentences that are two years or more. Rates of HIV in federal prisons grew from 14 reported cases in January 1989 to 159 in March 1996 and to 217 in December 2000

(Lines, 2002). In 2005 and 2006, more than half of new admissions to CSC prisons accepted a screening blood test for HIV (CSC, 2011). Year-end point-prevalence estimates for HIV were 1.67% (n=204) in 2005 and 1.64% (n=218) in 2006, compared with the estimated 0.2% prevalence of HIV in the general Canadian population (CSC, 2011). During the same timeframe, about half of new admissions accepted a screening test for HCV. Point-prevalence estimates for HCV infection were 29.3% (n=3,581) in 2005 and 27.6% (n=3,661) in 2006, compared with the estimated 0.8% in the general Canadian population. According to CSC, HCV is the “largest communicable disease burden” in its prisons. Given the voluntary nature of the screening program for new admissions, these prevalence numbers likely underestimate HIV and HCV in federal prisons. However, recently the Office of the Correctional Investigator (2014) noted that CSC offers a “fairly robust” program of immunization, surveillance, and screening protocols for HIV, hepatitis, and sexually transmitted infections (STIs).

Testing uptake seems to have increased. In 2007, CSC conducted a National Inmate Infectious Diseases and Risk-Behaviours Survey (NIIDRBS) with a large sample of prisoners (n=3,370) from across Canadian federal prisons (Zakaria et al., 2010). The NIIDRBS report indicated that most men (71%) and women (85%) were tested for HIV during their most recent incarceration at a CSC prison. Most men (74%) and women (83%) were also tested for HCV. Among those tested, 4.5% of men and 7.9% of women self-reported being HIV-positive, while 30.8% of men and 37% of women self-reported being HCV-positive. Compared to men, Canadian women prisoners have even higher rates of HIV and HCV infection (CSC, 2011; Lines, 2002). According to recent and preliminary unpublished CSC data, annual HIV prevalence has remained stable, between 1.5 and 2% from 2000 to 2012, while annual HCV prevalence reached 30% in 2008 but decreased to 18.5% in 2012.

Importantly, rates of HIV and HCV in prisons are disproportionately higher among Indigenous groups, particularly Indigenous women (i.e., 11.7% for HIV and 49.1% for HCV among Indigenous women; Zakaria et al., 2010). It is crucial to note that there is a general overrepresentation of Indigenous groups in Canadian prisons. Although approximately 4% of the Canadian population are Indigenous, Indigenous people represent approximately 23% of all federal prisoners in Canada (Office of the Correctional Investigator, 2013), with rates much higher in the Prairies (Canadian HIV/AIDS Legal Network, 2008).

The provinces and territories also have their respective correctional systems that oversee the administration of sentences of up to two years less a day. Some studies of HIV and HCV in provincial and territorial prisons have been conducted, but a complete and up-to-date picture across all systems is lacking and very much needed. Nonetheless, available evidence suggests that rates of HIV and HCV are also much higher in provincial prisons compared to the general population. The Canadian HIV/AIDS Legal Network (2008) has reported that studies from British Columbia, Ontario, and Quebec have found HIV seroprevalence levels more than 10 times higher in provincial prisons compared to the general population. For example, a study of 1,607 prisoners from seven Quebec prisons found HIV rates of 2.4% among men and 8.8% among women (Poulin et al., 2007). The same study found HCV rates of 16.6% for men and 29.2% for women. In a study of a British Columbia women's institution that housed both provincial and federal prisoners, 52% of participants reported HCV infection (Martin et al., 2005; see also Calzavara et al., 2007 for information on Ontario).

Evidence of risk behaviours in prisons

Despite zero-tolerance policy and enforcement efforts to keep drugs out of prisons, evidence shows that drug use – including use of various illicit and pharmaceutical drugs, and injection drug use – occurs inside Canadian prisons (Milloy et al., 2008; Small et al., 2005; Standing Committee on Public Safety and National Security, 2012). In self-report studies, the extent of drug use is likely underestimated due to prisoner concerns about consequences for disclosing their drug use.

Reporting on findings from the NIIDRBS, Zakaria et al. (2010) stated that in the past six months 17% of men and 14% of women reported injecting drugs, while 34% of men and 25% of women used non-injection drugs while in prison. Among those who reported injecting, 55% of men and 41% of women reported use of a used needle and 38% of men and 29% of women shared a needle with another person who had HIV, HCV, or was of unknown status (Zakaria et al., 2010). Men were more likely than women to report sharing equipment (e.g., water, cookers) with someone who had HIV, HCV, or was of unknown status. Since needles are prohibited items in Canadian prisons they tend to be scarce, heightening the chance of reuse and multi-person use of the needles that are available (Chu & Peddle, 2010; Small et al., 2005). The research by Martin et al. (2005) on women in British Columbia prisons found that 36% of 104 participants reported illicit drug use while in prison, and 21% reported in-prison injection drug use. In their study of Quebec pro-

vincial prisons, Poulin et al. (2007) described injection drug use as “by far the most important risk factor for both HIV and HCV infections, with more than 90% of the participants infected by either of these viruses reporting this behaviour before their imprisonment” (p. 254). International literature also documents that drug use and injection risk behaviours, such as sharing equipment, are common inside prisons (e.g., Long et al., 2004; Pollini et al., 2009; WHO, 2005).

Piercing and tattooing are other HIV, HCV, and HBV risk behaviours related to equipment sharing and reuse that occur inside Canadian and international prisons (CSC, 2009; Crofts et al., 1996; Dolan et al., 1999; Hellard & Aitken, 2004; Hunt & Saab, 2009; Kinner et al., 2012; Samuel et al., 2001; WHO, 2007). Please see chapter 2 in this document on *Needle distribution for anabolic steroid injection, hormone injection, piercing and/or tattooing* for further information about piercing and tattooing.

Harm reduction equipment distribution inside Canadian prisons

At the time of writing, there were no PNSPs in Canadian (provincial/territorial or federal) prisons and thus prisoners lack authorized access to sterile needles and other injecting equipment. CSC authorizes the distribution of condoms, lubricant, dental dams, and bleach within its prisons (Betteridge & Dias, 2007; Lines, 2002; Zakaria et al., 2010). According to Zakaria et al. (2010), 89% of prisoners were aware that CSC provides condoms and 87% were aware of bleach. Within its prisons, CSC also provides methadone maintenance treatment (MMT; Betteridge & Dias, 2007; Lines, 2002). All federal prisons provide MMT initiation and continuation to prisoners who were already on MMT in the community, while some provincial systems provide MMT initiation and continuation (Betteridge & Dias, 2007; Canadian HIV/AIDS Legal Network, 2008; Luce & Strike, 2011).

According to Zakaria et al. (2010), 57% of all federal prisoners surveyed reported an attempt (successful or unsuccessful) to obtain bleach during the past six months in prison. These authors also noted that a majority of those who reported injecting drugs, tattooing, or being pierced in prison used bleach to clean equipment. Please see the Best Practice Recommendations: Part 1 chapter 1 on Needle and syringe distribution for further information about bleach provision (Strike et al., 2013). There is a lack of evidence to support the provision of bleach as an effective measure to reduce HIV and HCV transmission in the community and in prison (Lines, 2002; WHO, 2004) and therefore we do not recom-

mend bleach distribution as a prevention method. Moreover, there are barriers to bleach access in prisons; inconsistencies in bleach access policies and the quality of bleach have been reported (Kerr et al., 2004; Lines, 2002; Small et al., 2005). Among prisoners who reported bleach access issues in the NIIDRBS survey (Zakaria et al., 2010), maintenance issues (e.g., broken dispensers, diluted concentrations of bleach) were the main problem, while 48% of women reported that they had to ask for bleach. The nature of the prison setting – that is, zero-tolerance drug policy and strict enforcement measures – makes it difficult for prisoners to clean their injecting equipment even when they do have bleach. Small et al. (2005) reported that prisoners are unlikely to have the time to thoroughly clean used needles and syringes. These authors added that prisoners agreed that bleach is not a solution to injection drug use and related harms inside prisons.

Educational programs in prisons

Educational programs are longstanding components of HIV prevention and harm reduction services in prisons (Ehrmann, 2002; Polonsky et al., 1994) and are important for both prisoners and staff. Based on their review of challenges and opportunities for HIV care in prisons, De Groot et al. (2006) recommended that “HIV peer education and behavioral interventions to reduce HIV risk behavior should be available in every correctional facility” (p. 175).

Educational content

The WHO (2005) recommends that educational programs cover risks related to injection drug use and equipment sharing, and advice on how to reduce risk behaviours. De Groot et al. (2006) noted that the Centers for Disease Control and Prevention recommended that in-prison HIV prevention efforts address risk behaviours such as male-male sex, injection drug use, and tattooing. In a review on preventing infectious diseases in correctional settings, Niveau (2006) stated that health education should cover information about diseases (e.g., tuberculosis, HIV, hepatitis, STIs), routes of transmission, risk factors, prevention strategies, disease outcomes, and potential treatments. Overdose prevention education is also key content for education programs. Overdose events and witnessing such events in prison are common occurrences (Albizu-García et al., 2009). The hidden nature of in-prison drug use, coupled with other factors such as reduced tolerance for certain drugs (e.g., opiates), reduced quality of drugs, and irregular drug supplies while incarcerated, may heighten risk of overdose. Prisoners may desire education on a range of additional topics includ-

ing the effects of various drugs, numbers for helplines and other useful contacts, and practical advice on avoiding drug use in prison and upon release (Seddon, 2001).

Knowledge of risk factors for sexually transmitted and blood-borne infection transmission varies among correctional populations (Getaz & Wolff, 2011). In the NIIDRBS survey, prisoners were asked 14 questions about HIV and HCV (Zakaria et al., 2010). Regarding knowledge of HIV, men and women correctly answered 80% and 83% of these questions, respectively. Men and women correctly answered 69% and 74% of the HCV questions, respectively. These findings suggest a need to increase education on HIV and further emphasize HCV. Zakaria et al. (2010) also reported that those who attended health education programs displayed slightly more knowledge than those who had not attended.

Correctional officers and nurses may hold more favourable views of education about issues like communicable diseases compared to other proposed harm reduction strategies in prisons (e.g., safer tattooing); however, they may not agree as to how and when to provide such education to prisoners (Miller et al., 2013). Staff from community-based organizations can play a role in supporting and training correctional officers and nurses about effective methods for comprehensive and consistent education.

Education delivery

There are few formal descriptions and evaluations of in-prison prevention and harm reduction programs, but there is evidence about the importance of collaboration among community-based organizations, correctional staff, and others to provide coordinated and comprehensive programs in prison settings (De Groot et al., 2006; Ehrmann, 2002). Community-based educators help to engage prisoners in HIV testing and counselling services, train prisoners to be peer educators, educate and train correctional staff, draft and update educational materials, and collect evaluation data. Strategies typically used by community-based organizations to provide programming include peer education and prison discharge planning (Ehrmann, 2002).

Risk reduction and prevention education for prisoners can be delivered within prisons by community educators, staff, prisoners/peers, or a combination of these groups in the form of one-on-one and group sessions. Compared to community educators, peer educators may increase the potential to build trust with other prisoners; they can add another source of support. As well, peer educators are well-placed to understand what types of education approaches might

work best in their prison setting (Kerr et al., 2004). Peer-based counselling and/or one-on-one formats may be desirable as privacy and confidentiality are highly important concerns for prisoners (see Pulford et al., 2013). The WHO (2005) states: “Involving drug users in developing, designing and delivering information materials is critical to increase their appropriateness and range of reach” (p. 8). The WHO (2005) further recommends delivering information through a variety of methods and notes that in-person counselling or communication can provide the benefit of “a process of clarification and reinforcement” (p. 8). While peer-based programs have advantages, barriers that prevent opportunities to train and supervise peer educators may limit effective delivery and design of interventions and care to prisoner populations. Features considered to be “essential” for successful peer programs include that the peer counsellor: is respected by other prisoners; has an accessible office located outside of the view of security; has access to a computer and printer to produce educational materials and also to correspond with community organizations; has support provided by prison healthcare staff; and can distribute approved HIV and HCV prevention and harm reduction materials (e.g., condoms, lubricant, bleach; Betteridge & Dias, 2007).

As well as in-person counselling, other useful types of education formats include easy-to-understand brochures, postcards, and videos (see Seddon, 2001). Educational materials for prisoners need to be developed to ensure access for varied language groups and those with lower literacy levels. It may be challenging to develop education and support programs that accommodate the diverse range of prisoner needs, and prison location, size, and security classification (Dyer & Tolliday, 2009). Regarding access issues, some institutions will not allow or have banned written educational materials and pamphlets containing harm reduction information (Watson, 2014). Gender and cultural diversity are key considerations, particularly in the Canadian context given the at-risk profiles of incarcerated women and overrepresentation of Indigenous peoples in prisons; thus special emphasis and tailoring of programs and education are needed for women and Indigenous prisoners (Betteridge & Dias, 2007).

Efforts in Canada

Assessing prevention and harm reduction education efforts in Canadian prisons is a challenge. In 2002, Lines explained that in Canada, “provision of HIV and HCV prevention education for prisoners is poor. Education is not mandatory in the vast majority of jurisdictions, and some correctional sys-

tems still do not provide basic HIV educational programs” (p. iii). However, it appears that efforts have increased and improved over time.

A number of Canadian organizations aim to address these shortcomings and the following includes a few notable examples we wish to highlight, although these examples may not capture the full range of organizations involved and efforts underway across the country. In Ontario, a leading organization on prisoner health and advocacy is PASAN (www.pasan.org). Formed in 1991, PASAN exclusively provides HIV and HCV prevention education and support to prisoners and former prisoners. The agency’s website contains numerous tools and resources related to harm reduction, listings of community-based agencies across Canada, and descriptions of their education and outreach services. PASAN’s staff conduct workshops and training for service providers who work with prisoner and former prisoner populations and people who use drugs. PASAN has also made recommendations regarding provision of education in prisons including, among others: allowing former prisoners access to current prisoners to provide peer education and training; increasing funding to community-based organizations working with prisoners to develop education programs; hiring health education nurses from outside corrections to work with prisoners and staff in federal and provincial prisons; offering annual health fairs in federal and provincial prisons; and developing culturally appropriate (especially in relation to Indigenous peoples) and “literacy sensitive” education materials and providing these in a number of languages (see guidelines at <http://canadianharmreduction.com/node/484>).

British Columbia and Quebec are also active in prisoner health programming. The Collaborating Centre for Prison Health and Education (CCPHE; <http://ccphe.ubc.ca/>) is a multi-stakeholder group that creates collaborative opportunities in research, service engagement, and advocacy on issues related to prisoner health. Positive Living BC has a Prison Outreach Program that provides educational HIV programs to prisoners and staff in provincial and federal prisons. Educational resources about supporting prisoners with HIV and safer tattooing can be found on the program website (www.positivelivingbc.org/service/prison-outreach). Recognizing the unique needs of women prisoners, a number of community-prison programs have been developed for women in British Columbia, including an HIV outreach program that provides on-site HIV care at a women’s provincial correctional centre (Granger-Brown et al., 2012). Various organizations in Quebec provide service to prisoners and former prisoners, including conducting education in-reach

to provincial and federal prisons (see Perron et al., 2006; see also <http://reductiondesmefaits.aitq.com/index.php/capsules-itss-mainmenu-49> for relevant information capsules).

In terms of other educational programs for prisoners across the country, Lines (2002) reported a substantial amount of variation (e.g., prisons with and without relationships with outside medical staff, AIDS service organizations, and other community-based organizations that come inside to provide education; some prisons offered peer education, but often it is one-on-one counselling with prison health or nursing staff). There was also a lot of variation in terms of education and training for staff (e.g., part of mandatory training about infectious diseases in some regions, sometimes “refresher” educational sessions offered). The situation may have improved over time, although there are still gaps in our knowledge. Based on a later review of program, policy, and training materials from all legislative jurisdictions in Canada and visits to federal, provincial, and territorial prisons in eight provinces, Betteridge and Dias (2007) compiled information on HIV, HCV, and related services. These authors provided detailed descriptions of some peer educator and community-based programs delivering prevention and harm reduction education to prisoners, as well as training and educational programs for staff. According to their reporting on a survey of policies, federal prisons and eight provincial and territorial systems had policies on education and information about HIV and HCV for adult prisoners, while federal prisons and nine provincial and territorial systems had policies on such education for staff (p. 24). Betteridge and Dias (2007) noted that while all CSC prisons are supposed to have a Peer Education and Counselling program, not all federal prisons do. They also reported that programs provided by community-based organizations varied across prisons. It is clear that there is a lot of variation, limitations, and lack of rigorous evaluation – and key policy and program information was current up to the first half of 2006, meaning it could very well be outdated. Nonetheless, this report offers a resource programs may wish to consult to get a sense of local programs that have been run, may be still be running, and contacts to determine what is happening in their region.

Betteridge and Dias (2007) recommended a list of strategic directions for action that included finding agreement on “best policy and practice for HIV and HCV prevention and harm reduction in prisons, thereby setting the standard that all Canadian jurisdictions should strive to meet, taking into account their particular circumstances” (p. 3).

Education and referrals for people soon to be released from prison

Following release from prison, people are at increased risk of returning to drug use and/or increasing their drug use, high-risk behaviours related to the transmission of blood-borne pathogens, life instability, and stressors (Ehrmann, 2002; Rich et al., 2001). Offering services that help sustain or improve continuity of care may help reduce these problems. Effective discharge planning needs to start prior to release from prison and provide links to comprehensive health and social services in the communities former prisoners will be returning to. People exiting prisons, including those living with HIV, may need and desire referrals to a variety of community-based services including HIV treatment, housing, substance use treatment, mental health services, and employment services (Rich et al., 2001). For people who use drugs, connections to community-based substance use treatment and harm reduction programs like MMT and NSPs help ensure continuity of care and access to safer drug use equipment and education.

Overdose prevention education and provision of naloxone kits and/or referrals to programs offering overdose prevention education and kits are crucial components of education and planning for those soon to be released from prison. The period immediately following incarceration is a high-risk time for overdose and drug-related death (Binswanger et al., 2007, 2013; Merrill et al., 2010). In a meta-analysis of studies that followed adults for mortality from time of release up to 12 weeks, Merrill et al. (2010) found a three to eightfold increased risk of drug-related death when comparing the first two weeks after release with weeks 3-12.

Naloxone reverses the respiratory depression that occurs with opioid overdose. A randomized controlled trial, N-ALIVE, is underway on naloxone distribution to people who use drugs who have recently been released from prison (Strang et al., 2013; see also www.kcl.ac.uk/ioppn/depts/addictions/research/drugs/N-ALIVE.aspx). This study will enroll 5,600 pilot testers and expand to 56,000 participants for the full trial (Strang et al., 2013). A few studies have already shown that providing people exiting prison with take-home naloxone may be an effective way to prevent deaths due to overdose (Green et al., 2014; Information Services Division, 2014). Please see the Best Practice Recommendations: Part 1 chapter 11 on Opioid overdose prevention: education and naloxone distribution for a review of evidence about community-based naloxone (Strike et al., 2013). A more recent systematic review of take-home naloxone that included 21

studies with community samples concluded that “educational and training interventions with provision of take-home naloxone decrease overdose-related mortality” (EMCDDA, 2015, p. 11). Weaker, albeit consistent, evidence supports education and training interventions with naloxone for “opioid-dependent patients and their peers” as an effective way to enhance knowledge and positive attitudes regarding correct use of naloxone (EMCDDA, 2015). At the time of writing, CSC did not provide naloxone training during the discharge stages. However, in its discharge planning and transfer guidelines, CSC recently included recognition that prisoners need community resources and harm reduction information, including take-home naloxone kits for overdose prevention (Buxton, personal communication, 2015). This atypical acknowledgement from CSC about harm reduction resources could be a sign of increasing collaborative efforts between community-based programs.

Education and other services for the prison context evidence summary

The evidence that informs this chapter mostly came from a mix of qualitative studies, reviews, observational studies, and grey literature including reports that contained literature or background reviews. Cross-sectional studies have contributed information about blood-borne infection prevalence and risk behaviours in prisons. There are relatively few empirical studies that explicitly address community-based organization in-reach or provision of harm reduction education to prisoners.

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Appendix A – Methods: Overview of Research Evidence Review and Synthesis

Reviews and syntheses of scientific evidence about public health interventions are complex because these interventions are comprised of multiple components (e.g., information, education, building and mastery of skills) and the types and quality of available scientific evidence are varied (Centre for Reviews and Dissemination, 2009; Jackson & Waters, 2005; Pawson et al., 2005). To prepare the chapters in this document, we used a narrative synthesis method. Narrative synthesis is well suited to the complexity and multi-component character of harm reduction programs that deliver a range of services to people who use drugs and are at risk for HIV, HCV, and other harms. This synthesis approach combines systematic collection, quality assessment, and synthesis of multiple types of studies and research evidence – experimental studies, observational studies, and qualitative studies – using rigorous and reproducible methods. We followed a system similar to the seven steps of narrative synthesis set out by Popay et al. (2006):

1. Identifying the review focus, then searching for and mapping the available evidence (i.e., describing the types of interventions, study designs, and volume of literature)
2. Developing a “theory” or explanation of how the intervention/activity works to produce the desired effect
3. Specifying a scientific evidence review question including population, interventions, and outcomes
4. Identifying studies to include in the review
5. Extracting evidence and appraising its quality
6. Synthesising the evidence across studies
7. Reporting the results of the review

We designed our project to have a series of overlapping and iterative activities including evidence identification, extraction, review and synthesis, and development of best practice recommendations. Over the course of the project, we held regular teleconference meetings to achieve team consensus on all activities and outcomes.

Development of a table of contents and work plan

Our team used a consensus decision-making approach to develop a table of contents that listed all core areas of practice to be included in the new best practice recommendations, for both Parts 1 and 2. We then developed a formal research proposal and work plan to complete the necessary reviews, literature syntheses, and integrate the evidence into the best practice recommendations.

Identification and extraction of research evidence related to each core area of practice

Searches of Medline, Embase, PsycINFO, Sociological Abstracts, CINAHL, and Scopus were performed for each content area. With a few exceptions, the databases were searched from 2006 onwards. This year corresponds to the oldest set of best practice recommendations in Canada (i.e., Ontario best practice recommendations for needle and syringe programs; Strike et al., 2006).

Eligibility criteria for documents to be considered for the review included: (a) subject relevant to the content area; (b) published in English or French; and (c) reported results that are relevant to the context of the Canadian public health system. The reference lists of eligible articles were reviewed by hand to identify any other articles that may have met the inclusion criteria. For articles that did not meet inclusion criteria for a given content area, we reassessed their appropriateness for other content areas. If deemed potentially appropriate, these articles were retained for the review(s) in the other content areas. All remaining articles were discarded. We also supplemented this material with unpublished program evaluations from Canada and other grey literature.

Assessment of the quality of selected studies and evidence synthesis

In keeping with our goal to provide guidance best fitted to the Canadian context (while recognising variation across provinces and territories), we adapted an approach to evidence appraisal based on National Institute for Health and Clinical Excellence (NICE, 2012) methods that matched the scope of this project. After extracting the articles that were relevant, we assessed the quality of the studies and the lev-

el of evidence (e.g., randomized controlled trials, cross-sectional studies) outlined in the NICE methods. Based on the types of studies included and any patterns observed (e.g., evidence of risk behaviours mostly coming from prospective cohort and cross-sectional studies), a summary of the quality of the evidence was prepared for each main chapter. Summary boxes were intentionally brief and written in plain language.

For each chapter, the extracted evidence and quality assessment summary boxes were reviewed and compared to the explanation of how the intervention, activity, or program model works (e.g., mobile programs extend the reach of harm reduction services; distribution of needles for anabolic steroid injection may reduce injection risk behaviours). For some chapters in Part 2, published evidence was limited and/or what we found was of poorer quality. In such cases, we recommended program activities to evaluate the need for specific services and supplies instead of recommending best practice policies. We aimed to use a plain-language format to write evidence summaries for each core topic.

Development of best practice recommendations for each content area

At team meetings, evidence summaries and quality assessment summary boxes were reviewed and assessed; we used a consensus decision-making process to “approve” the content of each chapter, including the specific best practice policy recommendations and recommended program activities. Prior to the teleconferences, team members were sent working drafts of chapters. Team members were asked to comment on the evidence summaries and determine if further work would be necessary or if the summaries were sufficient for the group to draft best practice recommendations for the content area under discussion. Each recommendation was written using a plain-language format.

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